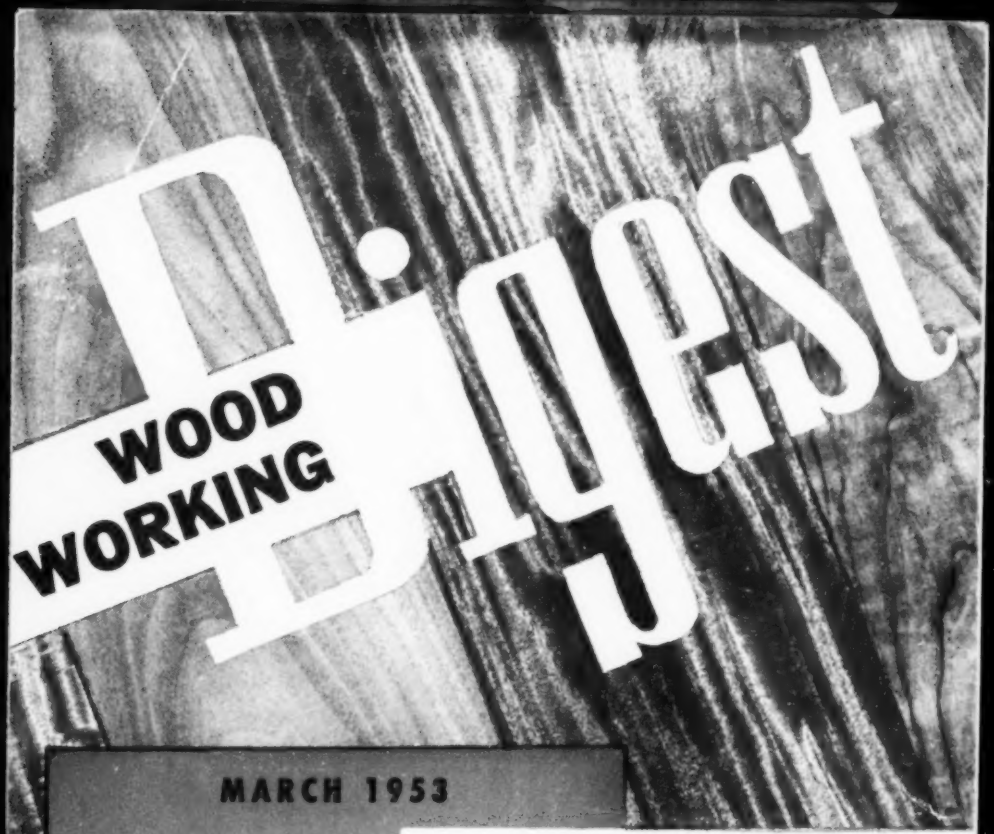

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Acceptance under Section 34.64, P.L.&R., authorized

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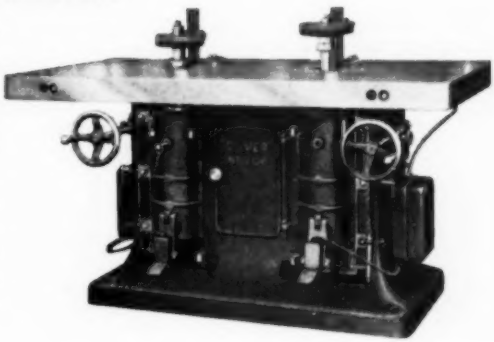
These 2 "Oliver" Shapers

give you all-around fast, smooth work!

Double Spindle Shaper is unmatched on light and heavy cuts

With or against the grain, this "Oliver" Shaper does the smoothest work. No springing on heavy cuts. Entire spindle unit can be lifted from yoke without removing yoke from machine. Offered with three types of drive: motor-on-arbor, close coupled belted motor, and V-belt drive, giving you spindle speeds to suit the work. Write for Bulletin No. 288.



Single Spindle Shaper produces smooth work feeding stock to cutters with or against the grain

This "Oliver" Shaper has many of the advantages of a two-spindle machine. It rabbets, grooves, routs and shapes with speed and accuracy. Choose from three types of drive: motor-on-arbor for speeds up to 8400 r.p.m., close coupled motor drive for spindle speed of 7200 r.p.m., and V-belt drive for speeds of 6000 r.p.m. or less. Write for Bulletin No. 287.

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Established 1890 **GRAND RAPIDS 2, MICHIGAN**

Your Rabbets Learn Good Habits

from this wonderful
WIZARD with **WOOD**

. . . that's why your reputation is safeguarded by using

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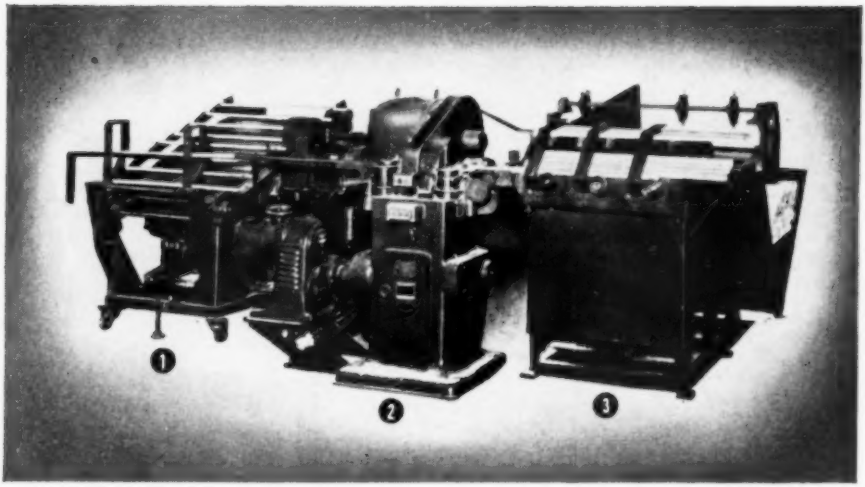

for now and for the FUTURE

The Hawker machines shown above can produce considerably more than a thousand complete and perfect units per hour, and continue to do so hour after hour. Hawker Automatic Hopper Feed (3), Two-Motor Rod and Dowel Machine (2), and Automatic Chucking Machine (1), are today's finest precision woodworking machines.

HAWKER MANUFACTURING CO.

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MACHINE TOOLS FOR THE WOODWORKING INDUSTRY

—and for the future each new Hawker machine development will help you get more product-per-tree even faster and with greater economy. We are now building a complete new plant that will more than triple our capacity to build Hawker equipment—and because that plant will be in production much sooner than expected we will announce the first of our woodworking machines for the future in the March 1953 magazines. To keep up-to-date on woodworking machine developments, keep in touch with Hawker. And watch for details of the new HAWKER MODEL 1000 next month!

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A precision built machine for finishing plastics, metals or wood to extremely close tolerances. Speeds production and assures uniformly finished surface over entire sheet. Will feed material from 1/32 inch to 6 inches. Available in several sizes, ranging from 24 inches to 54 inches.

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PUBLISHED MONTHLY

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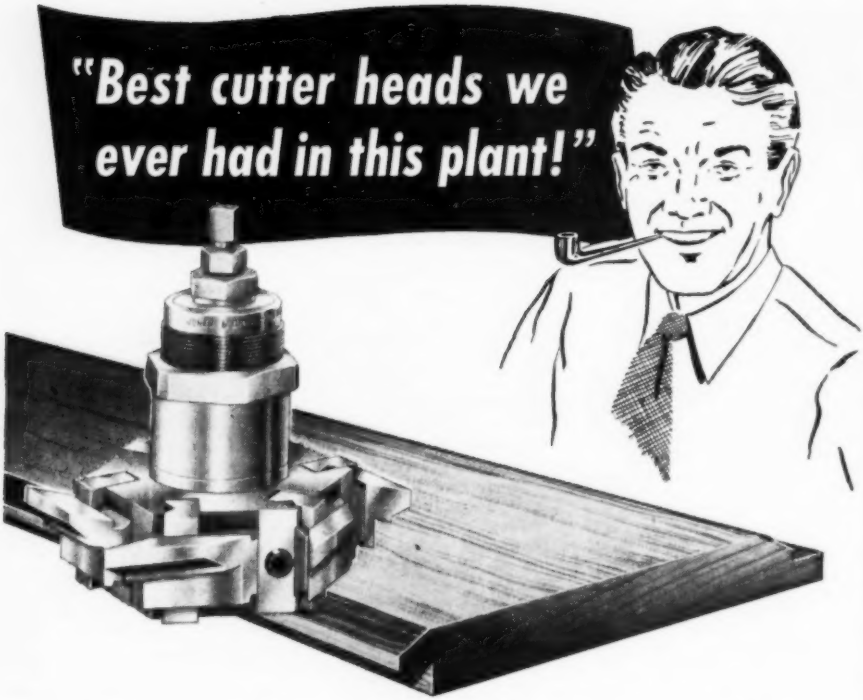

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With Jones & Orth cutter heads on the job everybody concerned is happy with the results — including the customers of the plant!

Jones & Orth users find that it is no trick at all to turn out a large daily output of consistently high quality, true-to-pattern work — with a minimum of maintenance and servicing expense.

Jones & Orth H-type cutter heads, such as the model illustrated, are unsurpassed for simplicity of design, perfect take-up for wear without change of pattern, and over-all economy. May we tell you more?

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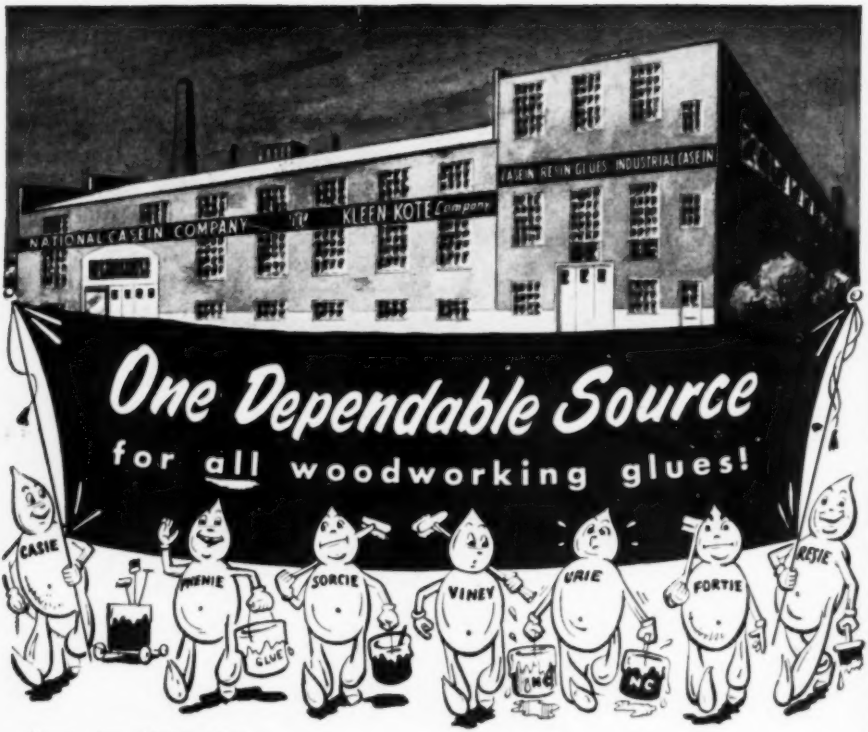

Here' the Right Glue for These Important Glue Jobs:

- ★ For exterior plywood, National's P-100 Phenol glue.
- ★ For interior plywoods, #750, #600 liquid urea or DR powdered resin.
- ★ For machine edge gluing, #750 liquid resin, with selected catalyst. Hand work: a wide variety of casein glues or DR powdered resin glue. Also National's #5000 for fast setting.
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- ★ For chipboard manufacture, #750 and #600 liquid resin; P-100 phenol glue.
- ★ For glues to pass all government specifications . . . for laminating hard boards, veneer splicing, laminated rafters, etc., contact office nearest you.

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If you aren't satisfied with the performance of adhesives you're now using, tell us about your glue job and we'll recommend a glue to do it — RIGHT!

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We are happy — and regretful. Happy because the acceptance and demand for this decorative fir plywood has been so spontaneous. Regretful because we can't seem to catch up with orders. It may seem odd that in a market of plywood plenty, there is, by comparison, so little *Sea Swirl* available. Yet this is understandable when you realize that only the most select panels qualify for this three dimensional product that captures the romance of soft ocean beaches and of tideprints in the sand.
We suggest that you write for a color booklet illustrating the many uses of this wonder wood. While you are studying it, and planning on the use of *Sea Swirl* for modernization and new construction, we will be increasing production facilities on this popular plywood.
ASSOCIATED PLYWOOD MILLS, INC.
General Offices: Eugene, Oregon
Plywood plants at Eugene and Willamina, Oregon
Lumber mill at Roseburg, Oregon
APM
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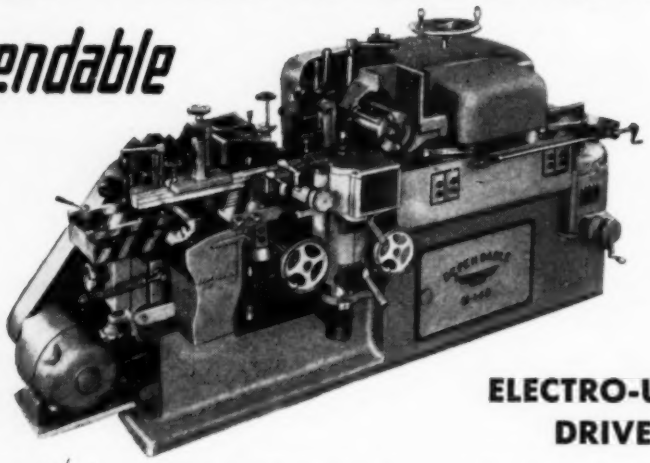
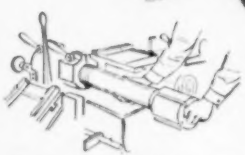
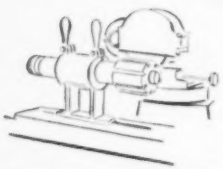


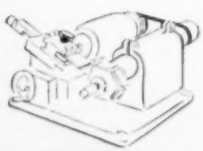
ELECTRO-UNIT DRIVE



Quick, easy removal of Cartridge Spindle Unit



Head being ground on Cartridge Spindle Unit



Head being jointed on Cartridge Spindle Unit

SIMPLIFIED DESIGN . . . makes it possible to produce this new high-production moulder at a much lower cost. Simplified design also simplifies operation; reduces maintenance and down-time, and increases production.

NEW CARTRIDGE SPINDLE UNITS . . . make it possible to set-up, grind, joint and pre-test all patterns in the grinding room. Change in pattern made in as little time as one minute.

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FREQUENCY CHANGER ELIMINATED . . . heads individually driven by standard motors giving high spindle speeds for multiple and single knife work. Total of 35 H. P. on 8" machine.

HEAVY CAST IRON CONSTRUCTION . . . rugged, one piece base, gives smooth, vibration-free operation.

A MOULDER MAN'S MOULDER . . . in 4", 6", and 8" capacities. Convenient, quick-acting controls; 100% ball and roller bearing. Simple maintenance.

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NEW LOWS IN PRODUCTION COSTS!
PROVE IT YOURSELF WITH...

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Saves wood... Saves time... Saves money!

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"...the greatest labor-saving machine yet installed in our new plant..."

That's what B. C. Vaughan, Pres. of the Vaughan-Bassett Furniture Co., has to say after using the TAYLOR PANEL-FLO for 6 months!

The Vaughan-Bassett Furniture Company selected the Taylor Panel-Flo after they had completed their search for *"the very best machinery available anywhere in the country"*.

First . . . because the Taylor Panel-Flo is of simple design for ease-of-maintenance . . . and trouble-free operation.

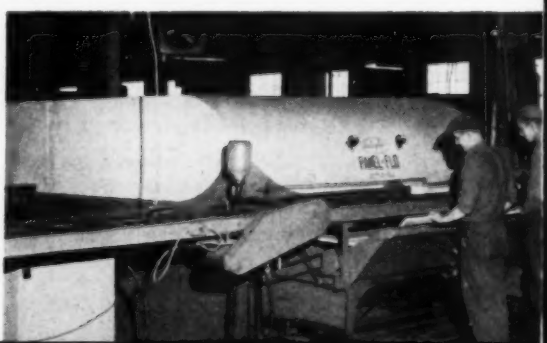
Second . . . because it is steam-heated for efficient . . . low-cost glue curing.

Third . . . because its *continuous feed* meets modern conveyorized production requirements.

Fourth . . . because it's simple to change to different lengths . . . widths and thickness of stock—without loss of production time.

Fifth . . . because there's the added dividend provided by the Taylor Automatic Cut-off Saw that has eliminated two men and one machine in the Vaughan-Bassett Company's production line.

Before you reach a decision regarding glue room equipment investigate the advantages which result through the use of the Taylor Panel-Flo. Write for details.



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"costs reduced, accidents reduced, and quality of work much improved . . ."

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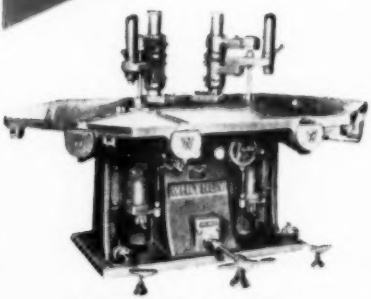
One of three Whitney Automatic Shapers, at Kalamazoo Sled Co. Shapes 8 complete sled slats at each loading of the form.



Whitney 2-spindle Automatic

Whitney Automatic Shapers are built in sizes and models for every shaping requirement.

As "Champion" sleds streak down favorite sliding slopes thruout the country so the production of sled (and furniture) parts speeds from Whitney Automatic Shapers at Kalamazoo Sled Co., Kalamazoo, Michigan, who have operated 3 Whitney Automatics for the past several years. Not only has the quality of work been improved but production has been substantially increased and there has been a marked reduction in accidents, according to Mr. T. H. Reminga, Production Manager.

For your important shaping jobs, large runs and recurring shorter runs, look into the Whitney Automatics, Single and Double Spindle, to get the most out of your shaping department. Bulletins gladly sent on request. Ask for Automatic Shaper bulletin D-3

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In Our 116th Year

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Turn Problems into Profits with Whitney Automatic Shapers

WE SELL THE FIRST *Standard...*
Performance SELLS THE REPEATS!

• The Standard Dry Kiln Company is proud of the many repeat orders it receives. Here are a few of Standard's hundreds of customers whose repeat orders are a sure sign they're completely satisfied with the performance of Standard kilns.

★ **HEYWOOD WAKEFIELD, Gardner, Mass.** Installed three new Standard kilns at their Conifer plant and then remodeled three existing kilns.

★ **TRUE TEMPER CORPORATION, Cleveland, O.** Installed a battery of prefabricated type Standard kilns at their Macon, Georgia plant. This makes a total of 12 True Temper Corporation plants that have Standard kilns installed.

★ **MURRAY WOOD HEEL COMPANY, North Walpole, Vt.** Installed three new Standard kilns and later equipped a fourth.

★ **SOUTH BEND TOY MFG. COMPANY, South Bend, Ind.** Remodeled one existing kiln and then added a new Standard kiln.

★ **NICHOLS AND STONE, Gardner, Mass.** Installed one Standard kiln and a year later added another one.

★ **U. S. NAVAL SHIPYARDS, Norfolk, Va.** Installed two prefabricated type Standard kilns (51 ft.) and recently ordered two additional prefabricated units (60 ft.).

★ **FRED MEARS COMPANY, Erving, Mass.** Installed two new Standard kilns and remodeled four. Recently installed three multizone type Standard kilns at South Charleston, Ohio.

Manufacturers of Internal Fan Kilns

Write for Illustrated Standard Catalog

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Engineers and Manufacturers Since 1887
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1. YOU MAKE A VARIETY OF CUTS – You rip, bevel rip, plough, groove, rabbet, shape and mould. And you may make many of these cuts at speeds up to 90 feet per minute!

2. YOU MAKE EACH CUT WITH PERFECT ACCURACY – Because the material is *automatically* fed at a constant rate, marks caused by uneven hand feeding are eliminated.

3. YOU REDUCE COSTS – Moulding, shaping and other jobs can now be performed by one man—instead of the two previously needed. Operator starts the material—end rollers guide it through perfectly.

4. YOU GET UNPRECEDENTED SAFETY – Now, as never before, you are completely guarded against kickback accidents. These are prevented by De Walt's special anti-kickback device.

5. YOU CUT WITH AMAZING SPEED – Power feed operates at three speeds – 22½, 45 and 90 feet per minute. Automatic performance takes the guesswork out of cutting . . . gives you precision results every time.

Why not see your De Walt dealer for demonstration, and find out how the De Walt Safety Power Feed can bring greater efficiency and economy to your cutting operations. Write for details to Dept. WWD-3, Lancaster, Pa.

De Walt Inc. Lancaster, Pa.

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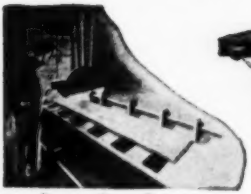
POWER SAWS

Subsidiary of

AMERICAN MACHINE & FOUNDRY COMPANY

New York, N. Y.

HARD TO GET? No



Swing Saw Gauge

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Shaper Clamps

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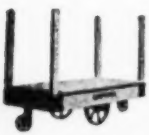
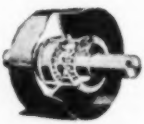


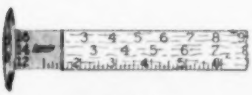
Factory Truck

Moisture Meter

Quick Acting Vise



Ball Bearing Loose Pulleys



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Fluting Heads

Picket Pointer

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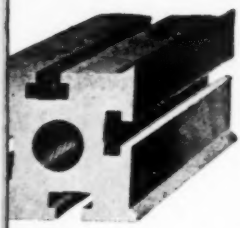
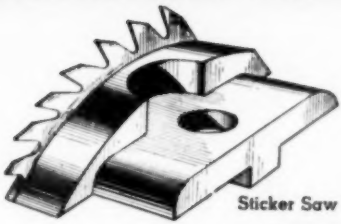
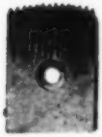
WRITE FOR OUR LARGE, COMPLETE CATALOG



Sticker Head



Sticker Saw Heads



Tenoning Spurs

Sticker Springs

Sticker Posts

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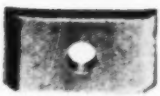
Matcher Bits

Balance Scale



Sticker Caps

Molders Gauge

Milled Knives

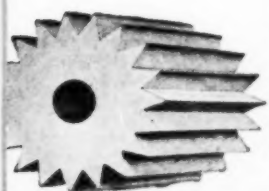
ping Knives

Moulding Knives

Planer Knives

Thin Knives

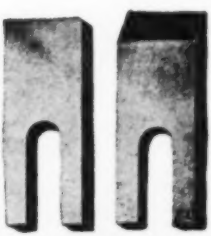
Shaper Steel



Steel Rolls

Tenoning Knives

Rabbet Blanks



Blanks

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220 SO. JEFFERSON ST.
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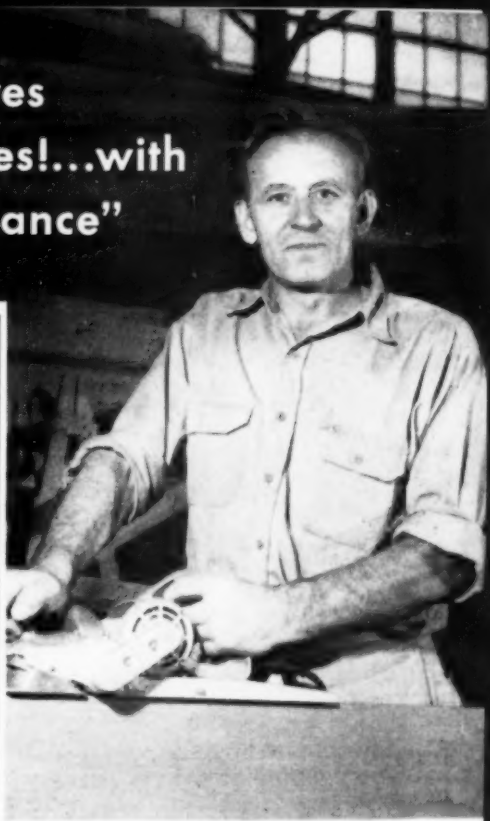
for a fabulous finish...

Finer finishing — sanding, smoothing, polishing — for all types of wood products.

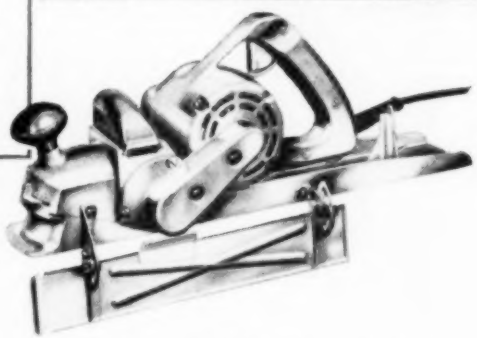
ABRASIVE PRODUCTS, INC.
551 Pearl Street **South Braintree 85, Massachusetts**

"Our SKIL Plane gives the finest finishes!...with the least maintenance"



—says **John Hinrichs,**
shipwright foreman,
Henry C. Grebe Co., Inc.,
Chicago, Illinois

Says this boat builder, "The SKIL Plane is best suited to our work. It weighs a third less than other comparable planes. The cog-belt drive requires no lubrication. This is important where a dozen men will use the same tool and depend upon someone else to see that it gets the proper maintenance. The cutter-head gives a ripple-free finish. And it's *two* tools in *one* because you can use it for either a door or surface plane."



SKIL 3" Plane—Model 190—High speed edge and surface plane. Reinforced, non-slip, cog-belt drive eliminates gears, minimizes shock loads. Width of cut: 3". Depth of cut: 0" to 1/8". No-load speed, cutter head: 13,500 r.p.m. Bevel guide: 90° adjustment for 45° right or left bevel. Bearings: Ball bearings throughout.

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SKIL Products are made only by SKIL Corporation
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5033 Elston Avenue, Chicago 30, Illinois
In Canada: Skiltools, Ltd., 3601 Dundas Street West, Toronto 9, Ontario

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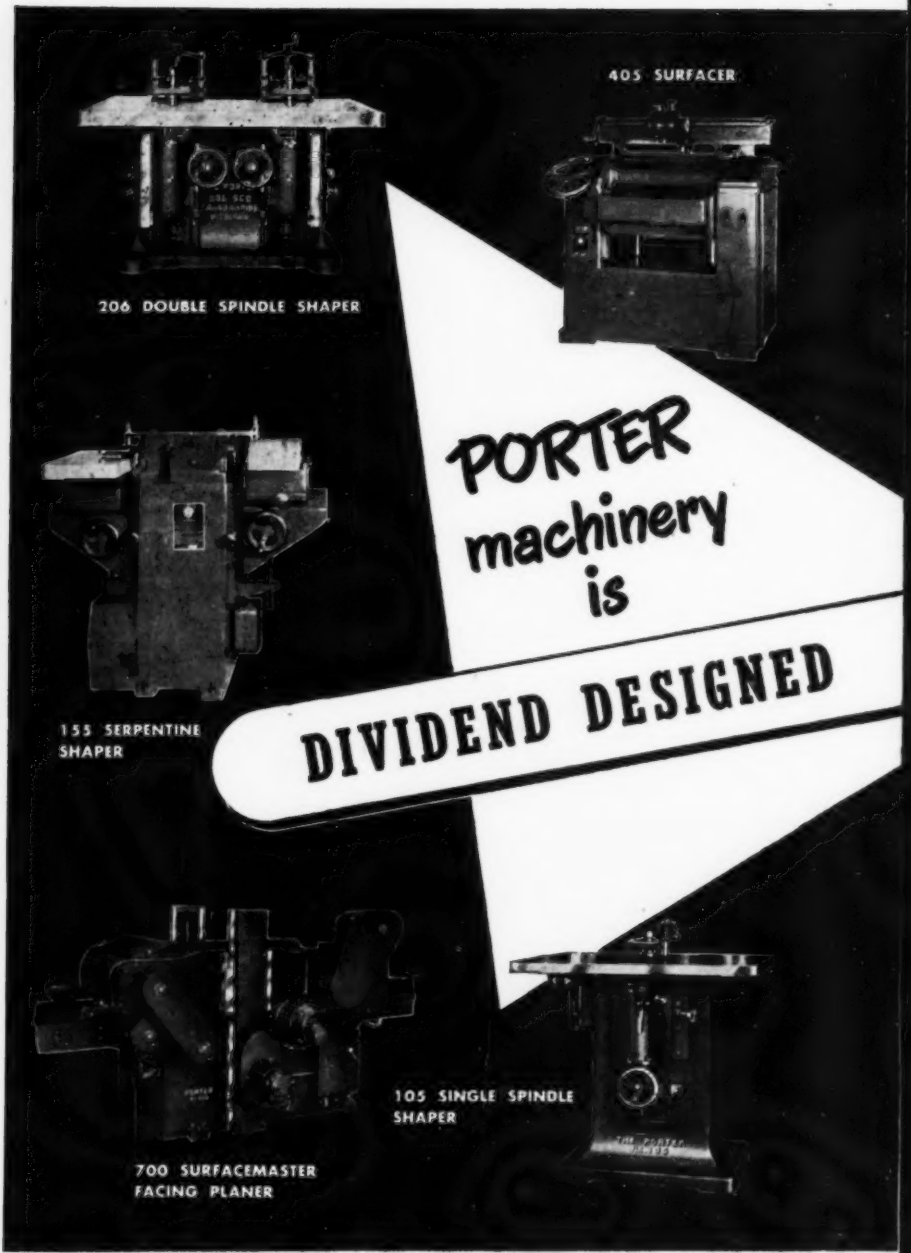
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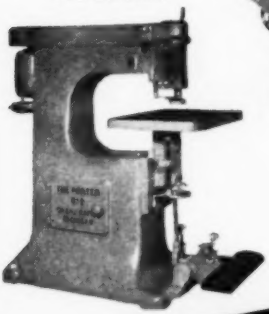


612 ROUTER

300 JOINTER

STRAIGHT LINE AND COMPOUND ANGULAR CUT-OFF SAWS

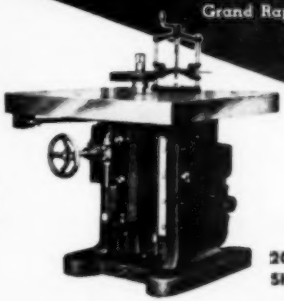
. . . to give you more production for every dollar you spend

Buying Porter DIVIDEND DESIGNED Machinery is like buying custom-built furniture at a popular price. You get so much more for your money. Your cost per job is less because Porter Machines are faster, take heavier cuts and require less adjusting. They have an extra margin of speed, capacity and strength not found in ordinary machines.

If you need a Router, Saw, Shaper, Planer, Carver, Jointer, Surfacer or Serpentine Shaper it will pay you to investigate Porter, the machinery designed for greater dividends.

C. O. Porter
Machinery Company
667 Front St., N. W.
Grand Rapids, Mich.

HYDRACUT SAW



203 SINGLE SPINDLE SHAPER

TWO ROOT BORERS

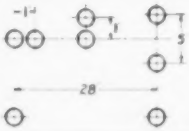
to lower your production costs!

STYLE D-150 FOOT AND HAND FEED RADIAL BORER

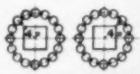
- Hi-Speed Electric Spindles
- Needle Bearing Radial Geared Heads
- Full Ball Bearing Operation of Feed—Reduces Manual Labor.

Send for new bulletin on style D-150.

TYPICAL SPINDLE CENTERS FOR STRAIGHT OR OFFSET BORING

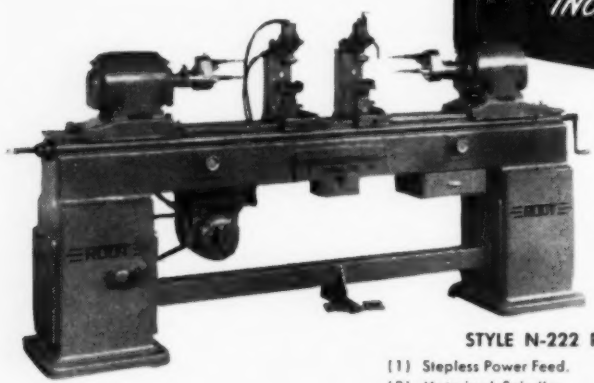


OFFSET BORING AT ANY POINT



Style N-222 DOUBLE END BORER

INCREASES OUTPUT



Dowel Boring at One Pass

Double End Chucking of Ladder Rungs, Crib Spindles, etc.

Large Single Hole Boring

STYLE N-222 PROVIDES . . .

(1) Stepless Power Feed.
(2) Motorized Spindles.
(3) Continuous Feed
(4) Intermittent Feed.
(5) Multiple Spindle Boring Heads.

B. M. ROOT CO. | YORK, PA.

VERSATILE *triple-duty* MACHINE

SAVES TIME SPACE MONEY

ROUTS—SHAPES—CARVES WITH SIMPLE CHANGE-OVER

Here's a multi-purpose machine shop men dream about. You can now rout, shape and carve—in any sequence—**all on one machine!** Important too, your changeover from one operation to another takes just minutes! Truly a remarkable development in production machinery—and it's exclusive in this Duro Router - Shaper - Carver. Used in leading industrial plants for more than 15 years—it combines ruggedness with speed (20,000 RPM), power (1200 watts max. output) and solid, heavy construction that assures smooth, accurate, vibrationless performance. Has many special features including: specially designed Universal Motor (A.C. or D.C.); New Departure Ball Bearings; instant table adjustment to any height; chuck is part of spindle and holds adaptor and cutter close to work—preventing whip; will work plastics and aluminum as well as wood—has many other features.

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Gentlemen: Please send me full details on your Router-Shaper-Carver. Also your latest catalog of Power Tools.

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Many woodworking jobs require special abrasives—and many use just regular abrasives. Whatever job you're doing, Armour has a *complete* line of quality coated abrasives for every woodworking job.

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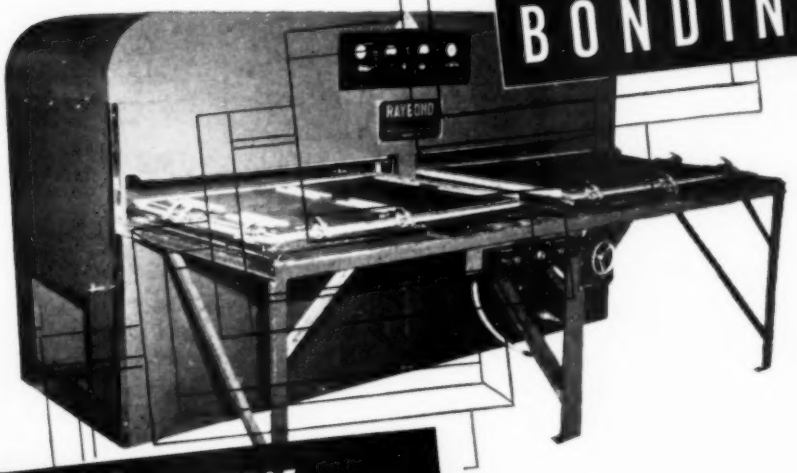
...for super-speed

panel-on-frame BONDING



this new *Dual* RAYBOND h.f.* press . .

Volume producers of "priced" cabinets can now further increase output and efficiency with this newest RAYBOND high-frequency panel-on-frame press and glue spreader. Entirely automatic, this two-tray press accepts a wide range of sizes and cures one load *in a matter of seconds* as the operator loads the other tray. High-frequency, equalized over the entire header surface, achieves bonding *complete* with no "forgotten" areas.

AUTOMATIC OPERATION:

Operator loads one tray with frame (glue side up) and panel thus eliminating smears, and toggles frame into position. Air cylinder draws loaded tray into press; pressure of solid header plus high-frequency heat achieves uniform bond. While operator loads second tray, the bonding time-cycle is completed, and the press automatically ejects tray with bonded panel-on-frame. Newly loaded tray is then drawn into press — and new cycle commences. Operator's attend to removal of finished panels only.

This new dual RAYBOND press is one of an extensive line of high-frequency bonding equipment used in the volume furniture field, particularly adaptable to mass production techniques.

Write for details to:

ELECTRONIC HEATING CORP.

66 Needham St., Newton Highlands, Mass.

*High Frequency

High frequency specialists in the wood-working industry.

INCREASE PRODUCTION as much as 100%

Lift Installed at	Production Increase
Double Surfacers	40% to 75%
Rip Saws	30% to 60%
Cut-Off Saws	20% to 50%
Matchers and Edgers	20% to 40%
Stacking Kiln Trucks	50% to 100%
Box Car Loading Dock	25% to 50%

INSTALL LEITELT LUMBER LIFTS

A glance at the above figures, FURNISHED BY USERS, proves how Leitelt Lumber Lifts increase production.

You can get these profitable increases in production and save the labor costs of one or two men with a Leitelt Lumber Lift in your plant or yard. Leitelt Lumber Lifts are built in a full range of capacities for handling loads from three to thirty tons easily and safely.

Let Leitelt engineers solve your production problems. Write Today.

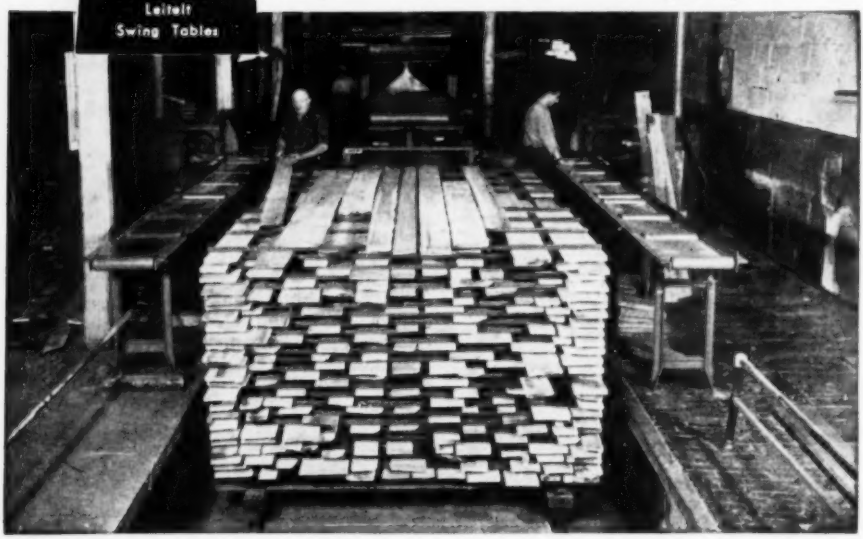
Also Manufacturers of Power Transfer Cars Car Pullers Power Driven Turntables Subcars and Leitelt Swing Tables

LEITELT IRON WORKS

"Pioneer Builders of Lumber Lift Equipment"

400 Mill St., Grand Rapids 2, Michigan

A typical modern installation showing a Leitelt Lumber Lift feeding two cut-off saws. This is how one of the largest table manufacturing plants in the country has increased their production at the vital point where material starts to flow through the plant.



"We DOUBLED production with a Stanley 02M Screw Driver"

"By using the Stanley Electric Screw Driver we now turn out 30 to 35 toy ironing boards an hour. Our previous speed (by hand) was 14 to 16 per hour," reports this wood-working plant.

The Stanley 02M is easy to operate, too. Adjustable clutch automatically stops driver at pre-determined tension. Handles bits for all types of screw heads and nuts.

In your shop there are operations where the Stanley Electric Screw Driver can increase production—save you time and money. Your industrial distributor will be glad to demonstrate the Stanley 02M and 02 for you. Get in touch with him today, or write for literature. Stanley Electric Tools, 433 Myrtle St., New Britain, Connecticut.

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... MADE BY MEN WHO MAKE TOOLS BEST

STANLEY Electric Tools

STANLEY
Reg. U.S. Pat. Off.

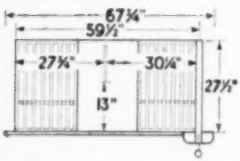
HARDWARE • TOOLS • ELECTRIC TOOLS • STEEL STRAPPING • STEEL

Atlas 10" FLOOR SAW

BALL BEARING EQUIPPED

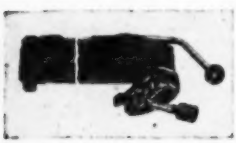
- ★ Cuts 3¼" Deep
- ★ Precision-Ground
- ★ Table and Extensions
- ★ Tilt/Arbor
- ★ Construction
- ★ Dual V-Belt Drive

Perfect for Piece-Work Sawing



SOLIDLY built, with the precision and rugged strength of a metal working tool, this Atlas 10" saw can add new versatility and new production speed to your shop. It handles large stock easily — the ground grey-iron table and extensions give plenty of support for big boards, panels.

On small work, the quick-adjusting rip fence with vernier control can save many valuable minutes every day. Get all the details about this perfectly designed production saw. Send for latest catalog.



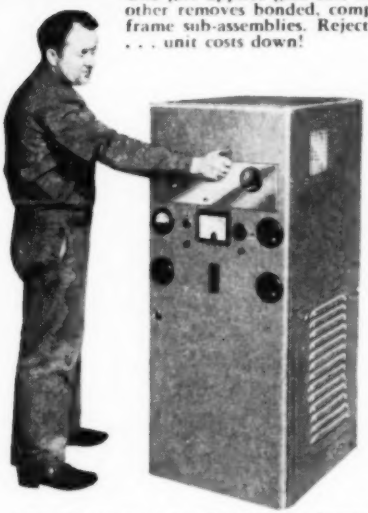
Quick-Set Rip Fence

Quick-Set Rip Fence locks or releases instantly, slides to position, lifts off! Saves time every time it's used.

ATLAS PRESS CO.
327 N. PITCHER STREET
KALAMAZOO, MICHIGAN

Atlas DEPENDABLE QUALITY TOOLS SINCE 1911

One girl applies glue and loads the machine, the other removes bonded, completely cured panel to frame sub-assemblies. Rejects virtually eliminated . . . unit costs down!



This Thermex 3-kw Bonding Equipment permits you to cut costs on many bonding operations. It's compact and portable. Time is saved by dual-load switch, while one load is being bonded, the other can be prepared.

Modernize... and cut unit costs!

● The only way to beat high costs of materials and labor is by more efficient production. Find out how you can modernize your production with THERMEX* Bonding Equipment. It's boosting output per manhour in hundreds of woodworking plants. Have a Thermex field engineer study your operations and make recommendations. Write the Girdler Corporation, Thermex Division, Louisville 1, Kentucky.

*THERMEX—Trade Mark Reg. U. S. Pat. Off.

Choose Thermex Bonding Equipment for:

EDGE-BONDING LUMBER • FABRICATING ASSEMBLIES • BONDING PLYWOOD
BONDING PANELS-TO-FRAMES • MOLDING LAMINATED PARTS

The **GIRDLER** Corporation

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BADGER
Planer Knives

BADGER KNIVES

to meet your every need!

BADGER
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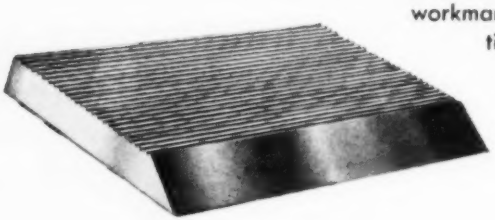
You can find the BADGER Trade-Mark on all types and sizes of woodworking Machine Knives. Such items as planer knives, thick slotted knives, corrugated-back knives, knife blanks and shaper steel, plain or notched, are available from stock — at your dealers or direct from the factory. Insist on BADGER Knives for your machines. They are your assurance of top performance, fine workmanship, and high production with absolute safety.



BADGER
Corrugated-
Back Knives

Engineers to the Woodworking Industry

CUTTERHEADS BADGER KNIVES

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Here's a New Portable Jig Saw with a Real Motor made by Black & Decker

... only $49.50

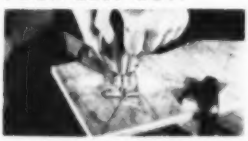
COMPLETE WITH 5 DIFFERENT BLADES FOR CUTTING PRACTICALLY ANY MATERIAL

THERE'S nothing like the Black & Decker Utility Portable Jig Saw! It does the work of a Jig Saw, Sabre Saw, Keyhole Saw, plus most Band Saw operations! Fits in the palm of the hand—all you do is guide it! Or, it mounts in an accessory table in 10 seconds. It's perfect for pocket cuts, pattern work, irregular shapes . . . cuts hardwood, softwood, plywood in a jiffy. A specially-designed B&D motor, custom-made for the tool, assures smooth, steady operation. See your nearest B&D supplier now for a demonstration. For more information, write to: THE BLACK & DECKER MFG. CO., 635 Pennsylvania Ave., Towson 4, Maryland.

HERE'S WHY THE B&D PORTABLE JIG SAW IS YOUR BEST BUY!

Sabre-type blade makes pocket cuts without needing a drilled "entrance" hole.

Compact, lightweight and shaped to fit the palm of the hand. Guides easily.



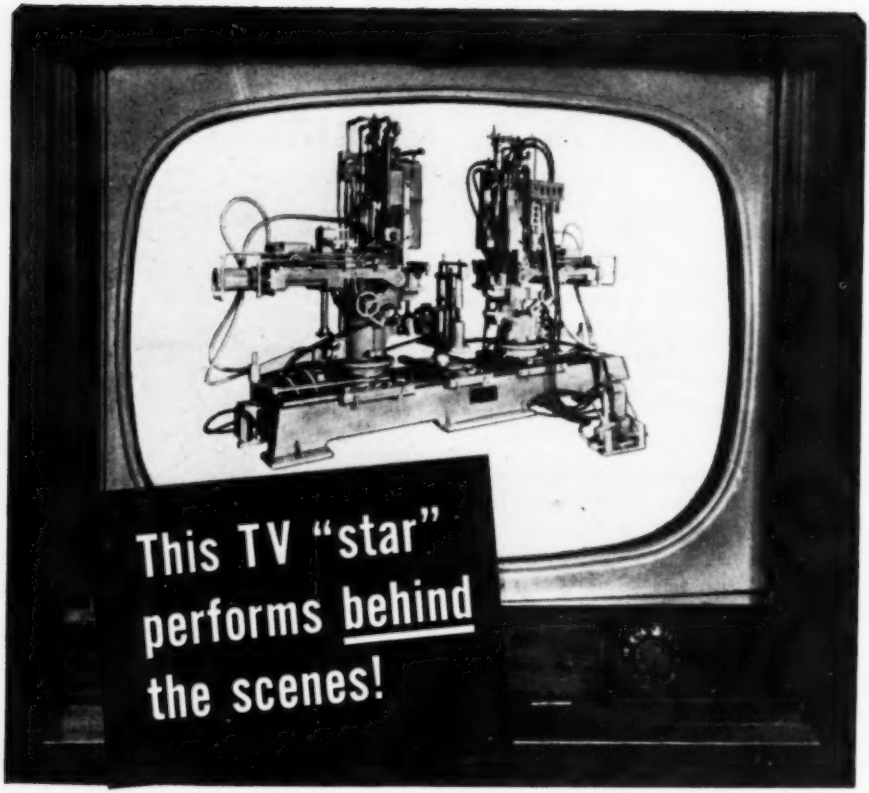
Fan cools motor and directs air stream to blow sawdust away from guide line.

Accessory Table for mounting saw . . . only $14.95

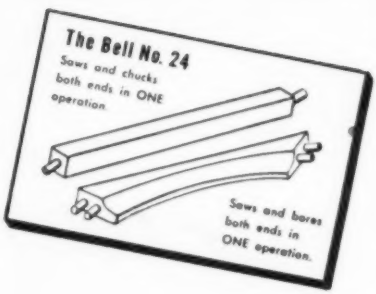
Black & Decker

UTILITY

PORTABLE ELECTRIC TOOLS



The Bell No. 24 SAWING, BORING and CHUCKING MACHINE is increasingly important in the TV picture — it performs cost-cutting wonders in the cabinet making shops! Saws and bores or saws and chucks in ONE operation — matched or compound angles. Produces as high as 1,000 pieces an hour (up to 1,500 if practical to cut two at a time)! Extreme accuracy speeds final assembly. **Write for complete data.**



BELL WOODWORKING MACHINERY

THE BELL MACHINE COMPANY
71 Jackson Dr. Oshkosh, Wisconsin

WOOD DATES OUR LIVES

The never-ending ways that wood influences our lives are a continuous source of amazement to anyone as closely associated with the material as I am. This time the cause for my wonder comes from a new and scientific exploration in radio chemistry.

This information may be old to some of you who follow such matters, but to me it is new, although original experiments began some time ago.

These experiments were made on pieces of dead spruce trees that had grown in a Wisconsin forest. In fact, the trees were alive during the last Ice Age that held northern United States in its grip. The wood had been sent to the laboratory at the University of Chicago's Institute for Nuclear Studies for testing.

It had been previously discovered by science that the rate of decrease of radio carbon is the same everywhere, and that rate is known. Because of this, it was possible, by measuring the amount of radio carbon left in these pieces of dead wood, to calculate the time that had elapsed since the death of the trees. Thanks to the very skillful development of laboratory operation, this measurement was obtained.

In the laboratory a radio chemist had set up an oscilloscope connected to a Geiger counter. Across the oscilloscope screen, which resembles a television screen, jumped a never-ending ribbon of green zigzag lines. These zigzag lines were made by the impulses coming from disintegrating atoms of radio-active carbon within the counter which had been extracted from these pieces of spruce.

The piece of wood being tested by the chemist was one of five samples, all collected from the same "buried" Wisconsin forest. When tested, all five gave answers very close to each other and they average 11,400 years. From all indications, the forest had been covered by a glacier. That took place, according to these calculations, 11,400 years ago. Several other similar tests on dead trees found elsewhere in the region have showed that about the same length of time has elapsed since the last glacial period in North America.

This accurate method of measuring the elapse of time through the use of dead wood and radio-active carbon adds another to the wondrous values of wood. Radio carbon dating is slow, expensive and difficult but the value to science is well-nigh immeasurable.

NED BAILEY,
Editor-in-Chief

REDCO

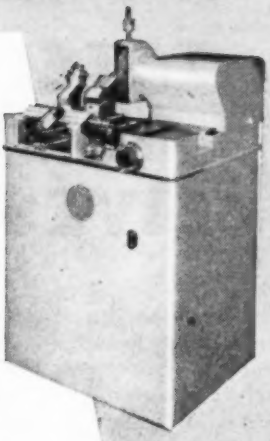
precision

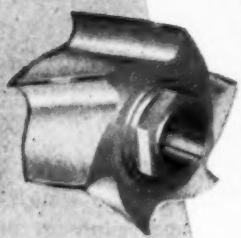
▸ **Carbide Tipped Tools**

▸ **Profiler**

▸ **Grinder**

. . . a combination that builds PROFITS

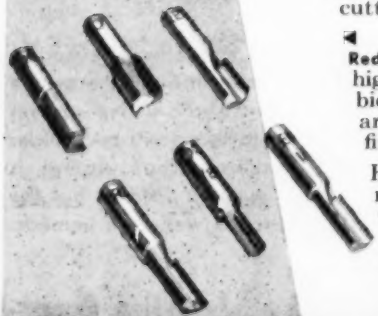




Redco Precision Grinder and Profiler . . . simplifies the grinding of Redco Carbide Tipped Tools.

Redco Cutter Heads . . . true helical cutting angle of 6 carbide knives, speed and ease the work; 90% less tear-outs.

Redco Saws . . . dynamically balanced with oversize carbide tips; durable; low maintenance; fast, clean cutting.



Redco Router Bits . . . heavier, high frequency-welded carbide tips, cut easier and are longer lasting; give a finer finish to all work.

Every Redco product is made especially for woodworking plants to meet particular woodworking standards. *Write for complete catalog today.*

REDCO TOOL DIVISION • Red Lion Cabinet Co., Red Lion, Pa.

Comments from THE NATION'S CAPITAL

By Arnold Kruckman
Washington Correspondent

The federal government has bought $4,516,000 worth of wood and sawmill products, and $3,155,000 worth of wood manufactures, in the four weeks since the last "Comments from the Nation's Capital" was written. Roughly, more than 95% of the wood and sawmill products were purchased by the army; the wood manufactures were distributed to every section of the country and were purchased by General Services administration, the army, the District of Columbia Government, the Federal Security agency, the department of justice, the Tennessee Valley authority, the treasury department and the navy. The different items included guard blanks, bridge material, crossarms, stands, laboratory tables, crating, cargo bins, storage cases, packing boxes, wood tanks, plane-table boards, seats, carrier cases, treadways, boxes, brush blocks, drying trays, pallets, wood applicators, drawing boards, furniture, walnut chairs, folding cots, school desks, plywood, flagstaffs, cases, library equipment and mop handles.

The recent purchases are representative of the diversity of the sources which require the products of the woodworking industry. It is frequently emphasized here that there isn't an agency in government that is not a potential customer. Orders will come from places in the government where you may not, by the most fantastic stretch of the imagination, expect to do business. The point of this is that no matter what you make, or sell, or the quantity you sell, or where you may be located, you probably can do business with the government. You can do business either as a direct bidder or by getting sub- and sub-sub-contracts. The last procurement report also stresses the fact that the trend is toward buying greater volumes of the products of wood.

The defense department has an accumulation of $101 billion, which has piled up since the emergency began, and which it still has to spend. The 1953-54 budget is expected to supply the additional sum of $50 billion for defense. To be perfectly sure that there can be no misunderstanding of these figures, it is proper to record that some of the senators who are in the following of Senators Taft and Byrd will try to reduce the 1953-54 budget by $10 billion. This would still leave the bewildering aggregate of $141 billion. It also is proper to record that those who seem to reflect the White House most intimately feel there will be little reduction in defense appropriation. Operations in Asia are expected to increase appreciably. Whatever minor reductions may be accomplished may be obtained in Europe.

However that may be, the important fact is that it is expected a staggering number of millions of dollars in that colossal total will be spent for the products of the woodworking industry. There is scarcely a thing that is made of wood that will not be used for that broad category included in defense.

Also, the numerous civilian agencies are bound to purchase many of the same things and materials. The civilian part of the budget totals between $20 billion and $30 billion. They tell you here that several billions will be spent in the building construction activities in which the government is involved. There is, for instance, Defense Homes corporation, which has spent fabulous sums; and the Defense Plant corporation, which is expected to become very active when the shadow plant program is put into action. And there is the Farmers Home administration which is spending hundreds of millions of dollars on building programs. Then there are the Federal Housing administration, the Federal Public Housing authority, the Home Owners' Loan corporation, the National Capitol Housing authority, the National Housing agency, the Tennessee Valley Associated Cooperatives, Inc., and there is the U.S. Housing corporation, and other government units, all of which, in some manner, engage in building construction.

This is the time for those who want business to use imagination and initiative, and to invest patience, in going after the prospective government business. A number of smaller business men have told us that they have secured an amazing amount of business by exploring the most remote prospects.

Apparently the greatest impediment many business men have to overcome is the mistaken idea that they don't know how. If you really want government business give this thought. Each agency, and often the different divisions or sections or parts of a specific agency, have procurement officers. These officials are listed under different titles. This is what to do: Write to the appropriate officer, or office, and ask to be advised how you can qualify for a listing on their bidders' lists. When your name is placed on the bidders' lists you are advised of every potential procurement that should be within your capacity to supply.

CONTINENTAL'S PROOF BOOK

E. J. GIVENS
Pennsylvania State College, B. S., 1944. Joined New York Wire Cloth Co. in 1948 as Industrial Engineer and became Purchasing Agent in 1950. Secretary of York Purchasing Agents' Assn.; member of National Assn. of Purchasing Agents; Purchasing Agents Assn. of Phila. and Society for Advancement of Management.

Incorporated 1917
NEW YORK WIRE CLOTH COMPANY
401 EAST MARKET STREET
YORK, PENNSYLVANIA

GENERAL OFFICES
NEW CANAAN, CONN.

February 11, 1953

Continental Screw Company
New Bedford, Massachusetts

Gentlemen:

As manufacturers of a new kind of product--the Durall aluminum tensino screen--we have been in an excellent position to appreciate Continental Screw's quality and service. For instance, we must have a screw that even a housewife can drive, and with a head large enough to seat properly in our screen clamp bracket. The screw that you designed for us has more than met our specifications.

Another feature that has resulted in additional sales appeal for our product is your method of fastening our screws on a tape, which has been pre-printed with our Durall brand name. This tape has proven a very convenient method of insuring that the exact number of screws reaches each customer.

Over a period of twelve months, our production schedules fluctuate, but whenever this happens you respond promptly with every possible effort to keep our line operating. We want you to know that this type of performance rates very high with us.

These extras, plus a top quality product, have given Continental the number one spot on our vendor list for screw requirements. It has been a pleasure to work with you during the past and earnestly hope that same association will continue for many years.

Sincerely,
E. J. Givens,
Purchasing Agent

You too can count on Continental.

CONTINENTAL SCREW COMPANY INC. 1904

Manufacturers of HOLTITE Fastenings For Every Purpose

CONTINENTAL SCREW COMPANY, NEW BEDFORD, MASS., U.S.A.

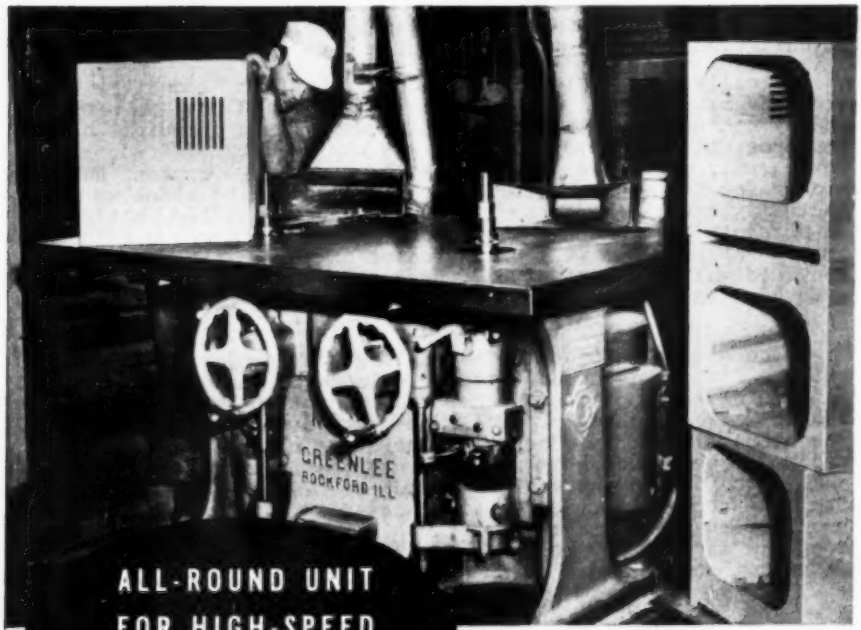
One of the best illustrations of procedure is the routine that is followed in the General Services administration. This agency buys something for practically every defense and civilian agency of the government, but it does not buy everything for all these agencies. Apparently the plan for the future is that General Services administration shall be the over-all federal purchasing agent for all those things bought by government which all government agencies require in common, and which come from the same source.

Write to the GSA, addressing the Business Service Center, General Services administration, in the region in which you are located. There are ten such regions. Region 1 is found at the Post Office and Court House, Boston 9, Mass.; Region 2, 250 Hudson Street, N.Y.C. 13; Region 3, 7th and D Streets, S.W., Washington 25, D.C.; Region 4, 50 Whitehall Street, S.W., Atlanta, Ga.; Region 5, Court House, 219 South Clark Street, Chicago, Ill.; Region 6, Federal Office Building, Kansas City, Mo.; Region 7, 1114 Commerce Street, Dallas 2, Tex.; Region 8, Building 41, Denver Federal Center, Denver, Colo.; Region 9, 49 Fourth Street, San Francisco 3, Calif. and Region 10, Federal Office Building, Seattle, Wash. If you are in doubt about the region in which you are located, write WOOD WORKING DIGEST.

In reply to your letter to the Business Service Center you will receive what is called a Mailing List Application. The blank requires that you state your name; the address to which the bidding forms are to be mailed; the address of the mail business office; the shipping point, and the names of the person or persons authorized to sign bids and supervise all matters concerning the bids and contracts. Then you are asked if you are a manufacturer within the meaning of this definition: "A manufacturer owns, operates or maintains a factory or establishment that produces on the premises materials, supplies, articles or equipment."

The next question asks if you are a wholesale dealer within the meaning of this definition: "A wholesale dealer owns, operates or maintains a warehouse, or other establishment, into which materials, supplies, articles or equipment are brought, kept in stock and sold to retail dealers." If you do not fit into either definition you are required to explain just what you do.

Next, you are required to indicate whether your firm is a corporation, partnership or sole proprietorship. They then ask how many years you have been in business; net worth of the business. If your firm is a subsidiary, it is required that you state the name of the parent company. Next you are requested to indicate whether you are interested in bidding on indefinite quantity or term contract; i.e., an indefinite quantity of material or supplies as may be needed from time to time during a definite period; or whether you want to bid on definite quantity contracts; i.e., a specific quantity of material or supplies for a specified point of delivery. The application blank bears a map of the United States divided into ten areas;



ALL-ROUND UNIT FOR HIGH-SPEED PRECISION SHAPING

. . . Greenlee No. 180-B Motor Driven Shaper

Here's the *double-spindle* Shaper that you find speeding production in so many leading woodworking plants today.

Its size, spindle spacing, and design for extremely high spindle speeds, makes the GREENLEE ideal for high output of light or medium-heavy work. And its belted-motor-driven feature eliminates need for a separate frequency changer.

Since the success of any shaper depends mainly on its spindles, all GREENLEE Shapers have spindles that are designed for maximum strength and rigidity. Of alloy steel, scientifically heat-treated, they are capable of withstanding hard shocks and stresses and still maintain their original fine balance. Equipped with precision ball-bearings, they operate at high speed with maximum smoothness.

Rugged frame construction, proper table design, highest quality materials and fine craftsmanship throughout all combine with the other many features to make this an outstanding machine of excellent reputation.

For accurate, high-speed shaping and long-time, trouble-free service, investigate the GREENLEE No. 180-B Double-Spindle Shaper. Write today for complete specifications . . . ask for Bulletin No. 180-B. Greenlee Bros. & Co., 1863Twentieth ..ve., Rockford, Illinois.

MACHINERY & TOOLS

GREENLEE

GREENLEE WOODWORKING MACHINERY: MORTISERS • BORERS • SAWS • TENONERS • PLANERS • SHAPERS • MORTISING and BORING TOOLS

you are asked to indicate on the sheet the area in which you can advantageously deliver your product.

Finally, you must sign this certification: "I certify that the information supplied herein is correct, and that no person in any connection with this establishment, as a principal or employee, so far as is known, is now employed by the federal government, or is now debarred by the federal government as a bidder for furnishing material or supplies." The blank warns that if you fail to respond to any Invitation to Bid, mailed as a result of the application you have made, by not bidding or by not replying, as will be indicated on the postal card provided with each set of bidding forms, your firm will be removed from the mailing list for the class of commodities involved.

There are 24 pages to the Mailing List Application. All but the first page are devoted to details of the 103 classifications of the supplies purchased by General Services administration. Woodworking products are scattered through many of the classifications. There is a separate classification for brooms, brushes and mops; for lumber; for furniture; for paints and lacquers; for the equipment and materials that go into building construction. You find virtually all the woodworking products in one or another of the classifications. If you supply a service or product not listed, you are expected to define it on the application blank.

The Small Defense Plants administration is the strongest influence and the most vigorous representative smaller business has as a guide in this welter of government procurement. It is sound sense for any smaller business man who plans to do business with the government to get acquainted with the SDPA. SDPA has a section known as the Office of Contract Procurement, headed by Charles Swisher as director. But the man with whom to establish personal relations is D. R. Farthing—no title—who has quietly been doing such an outstanding job for them that every smaller business organization, and unnumbered smaller business men, depend on him as their last recourse in problems that may arise. Suppose you bid on a government job. It may be wise to talk over the bid procedures with Mr.Farthing before you do it, or to get in touch with him when you have made your bid.

National Enforcement commission, which administers the wage and salary enforcement program of the Economic Stabilization agency, penalized Joe R. Ford, Chehalis, Washington, a tax disallowance of $941.19 because his logging company paid total wages of $26,582.52 in violation of General Wage Regulation 6—$1,917.03 was in excess of the amount permissible under GWR 6.

National Lumber Manufacturers association established a twelve-man forestry advisory committee to expand the work of its committee on forest conservation.

By the time this appears in print wage and price controls undoubtedly will have been wiped out in relation to wood products.

Modern finishing pays off for White Furniture Company

FOUR MODELS FOR ALL SANDING REQUIREMENTS

. . . ranging from a versatile single-pad model to a heavy-duty double-pad sander. Each available with necessary accessories for all finishing operations. Get complete specifications.

Sundstrand Air Sanders provide one of the important keys to fine finishing of case goods made by the White Manufacturing Company of Mebane, North Carolina. Straight-line action leaves no swirls, no pressure marks—eliminates costly, time-wasting hand sanding and rubbing. Result is a smooth, clear finish at each step of the process, ending in a perfect final finish. See your local Sundstrand supplier, or send for bulletin WW-3.

SUNDSTRAND

SUNDSTRAND AIR SANDERS

SUNDSTRAND MACHINE TOOL CO.

PNEUMATIC DIVISION, ROCKFORD, ILLINOIS

New! PRODUCTION GENIUS

DUO-FAST

Direct Drive

Air Tacker

. . . Used in
World's Largest
Automotive Body Plants

FAST—Drives 33 staples in 10 seconds.

EASY—Press trigger. Air does the rest.

POWERFUL—Drives into toughest materials.

CONSERVES AIR—Operates on 40 to 125 pounds, depending upon the power needed.

LIGHT—2 pounds. Ideal for women workers.

3-SEC. LOADING—Saves operators time.

JAM-PROOF—as a tacker can be.

12 Models

Send for the timesaving, moneysaving facts on Duo-Fast Direct-Drive Air Tackers.

FASTENER CORPORATION 860 FLETCHER ST. CHICAGO 14, ILL.

COMPANY.....

YOUR NAME.....

ADDRESS.....

CITY.....STATE.....

FASTENER CORPORATION

860 Fletcher Street • Chicago 14, Illinois

Pointed PARAGRAPHS

Optional depreciation is getting careful consideration. Under the present law, businessmen are required to write off the cost of plant and equipment over fixed periods—ranging from three years for a salesman's car to sixty-six and two-thirds years for a warehouse. Many tax people contend that companies should be permitted to write off plant and equipment over any reasonable period that they choose. Such a proposal was backed last year by the Senate Small Business Committee. Senator Frear recently introduced a bill to accomplish this same purpose.

The nation's taxpayers and Washington, D. C. businessmen were saved more than $30,000 by the resale of all lumber used to construct stands for President Eisenhower's inauguration. Total cost for the stands was about $135,000. Most of the lumber will be used in home construction. A small part of the wood platform from which Eisenhower took the oath of office has been made into special gavels for Vice-president Nixon and House Speaker Martin.

So many independent furniture dealers flocked to the annual show in High Point, N. C., that the "New York Times" commented: "The south is emerging rapidly as a furniture distribution center on a par with the industry kingpin—Chicago."

New one-piece, smooth-working furniture drawers made of Bakelite phenolic plastic are the first large plastic moldings incorporated into modern furniture design. Twelve attractive occasional pieces, including desks, cabinets, lamp and cocktail tables, are designed by Edmond J. Spence.

The Canadian Pulp and Paper Association is urging a survey of both Canadian and United States forest resources. Considering the tremendous increase in wood consumption in both countries and that, in Canada at least, the annual tree growth exceeds the depletion, the margin there as well as in this country has long since ceased to be substantial.

There is a feeling on the part of many retailers that furniture manufacturers should help the retailers through advertising. Considerable experiments in other fields show that this manufacturer type of cooperation pays off in orders for both retailer and manufacturer, particularly when competition is keen. Several furniture manufacturers spend sizable budgets helping their retailers merchandise the products they make.

One of the panel meetings at the recent Ninth Annual Convention and Exposition of the National Association of Home Builders emphasized the tremendous possibility of the trade-in as a house marketing tool. Builders were urged to give the idea "the full treatment" as a means of expanding the new house market.

Studies by the congress and government agencies indicate that housing needs in the United States by 1960 would require an annual volume of between 1,200,000 and 1,500,000 new units annually, according to the Housing and Home Finance Agency.

Realizing the inroads that were being made by metal furniture, the wood office furniture makers banded together and pooled their designing, manufacturing and selling techniques and have instituted a program of sales promotion among office supply dealers that is really paying off. Each month their association headquarters sends out an attractive and very well prepared eight- or twelve-page booklet in two colors showing the latest in wood office furniture and so edited that it can also be used by dealers in their contacts with the ultimate buyer. It cleverly gets the feminine office worker on the side of wood by showing that wood furniture is the most stylish, comfortable and efficient equipment that they can buy.

After decades of war, conversion and reconversion marked by tremendous government spending, this year will be one of preparation for a more stable economy. Clifford E. Evanson, president, Technical and Business Engineers, Inc., says that 1953 is to be a year of business adjustment. This year will be one of preparation for a more stable economy. Economic and social changes will take place gradually.

Reports on the Chicago Winter Furniture Market indicate that it definitely was the most satisfactory market in years. There was no panic or stampede, but there was solid buying.

March 19 is set as the date when the hardwoods exhibit will open at the Chicago Museum of Science and Industry. Financed by voluntary contributions from all segments of the hardwood industry, the exhibit will tell the complete story of hardwoods from the living tree, through manufacturing, to finished products. It is scheduled to open to the public on March 20.

NOW — durable bonding at lower costs!

New Penacolite® Modified Resorcinol Adhesive G-1288

is more economical to use . . .
forms permanent, waterproof bonds

KOPPERS development research once again has achieved a significant improvement in the process for making modified resorcinol adhesives. The result of this new process is "Penacolite" G-1288, a tough, permanent, element-resisting adhesive . . . that costs you *LESS!*

"Penacolite" Adhesive G-1288 is a two-component resorcinol-phenol formaldehyde resin adhesive. It cures rapidly without acid catalyst and provides a strong, lasting bond. Like all Penacolite Adhesives, G-1288 forms bonds that remain as strong as the woods they join, under all conditions of service, including exposure to fresh or salt water.

"Penacolite" Adhesive G-1288 will also bond phenolics, all cellulosic materials, many plastics, and some rubbers.

"Penacolite" G-1288 now enables industries which formerly could not afford to employ costly straight-resorcinol adhesives, to get the superior bonding of resorcinol-base adhesives, at a lower cost.

Write today for further details about new money-saving "Penacolite" Adhesive G-1288. Remember, too, that our technical service is always at your call.

KOPPERS COMPANY, INC.
Chemical Div., Dept. WWD-33, Koppers Bldg., Pittsburgh 19, Pa.

KOPPERS®

PENACOLITE® RESORCINOL ADHESIVES

The original waterproof, room-temperature-setting adhesives

NEWTON

OSCILLATING UNIVERSAL EDGE SANDER

—AVAILABLE IN TWO SIZES—

MODEL E-30 SHOWN

NEWTON EDGE SANDERS will produce better surfaces and cut costs on many sanding operations. The Model E-30 above carries an 8"x77" abrasive belt with a Platen 8½"x30" on each of the two sides. Platens are of cast iron machined perfectly flat. They can be used as hard platens, or with cushioned frictionless covers. The work table is extra large - 22"x52", the back half of which tilts for angle sanding. Table is of cast iron with ground and polished surface. The entire workhead oscillates and is powered by a direct-drive 3 H.P. TOTALLY ENCLOSED motor.

Also available in a smaller model having a 6½"x18" Platen.

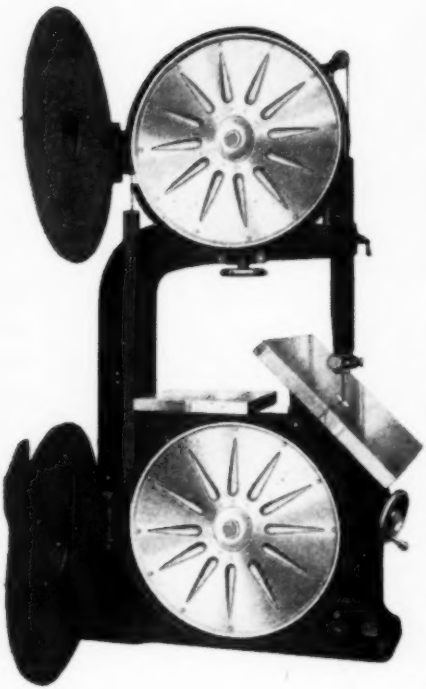
WRITE FOR DESCRIPTIVE BULLETINS

NEWTON MANUFACTURING CO. **TEMPLE, TEXAS**

950

FAY and EGAN

36" BAND SCROLL SAW



for wood or metal cutting. It's high speed, all-electric, ball bearing, safety sealed.

Big capacity: Takes 21" under guide and 36" from saw blade to the column. Distance front edge of table to saw blade, 12".

Fast: Saw blade travels 8,480 feet per minute, tensioned with knife-edge balancing device.

Instantaneous brake saves time, increases safety.

Safety sealed: Everything is under cover for greater operator safety.

Wheels dynamically balanced, steel disc type with demountable tires.

Rigid one-piece column assures steady, vibration-less operation.

The Fay & Egan 950 offers many other exclusive design and construction advantages that have made Fay & Egan first choice of master craftsmen since 1830. Why not get the complete story . . . write today for descriptive bulletin.

J. A. FAY & EGAN CO.
2070 Eastern Ave., Cincinnati 2, Ohio

Gentlemen:
- ☐ Send 950 bulletin by return mail
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Name _____

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EXPANSION HEAD BITS
CORRUGATED DOVETAIL EASED EDGE BITS — ALTERNATE PATTERN
VISE GRIP PATTERN BITS
TUNGSTEN CARBIDE TIPPED BITS
DOUBLE DOVETAIL CORRUGATED BITS
GROUND-TO-PATTERN BITS

MILLED-TO-PATTERN BITS

Milled-to Pattern Bits were pioneered by Yates-American. They were designed to improve production, quality of product, and all-around machine performance. Here are some of the ways YA milled bits do a better job for you:

Maintain pattern for uniform quality. Knives ground to pattern often have variations, which show up in the finished product. But milled-to-pattern bits always assure uniformity. The pattern remains exactly the same throughout each bit, as well as in sets of bits of the same pattern.

Faster feed rates. Since the pattern is uniform in the bit, more bits can be placed in the cut, permitting faster feed rates.

Cutting angle fixed for best results. The milled bit is always manufactured with the cutting angle correct for the material to be run, resulting in better finished stock.

Greater strength and safety. Milled bits have a body of steel behind the cutting edge, making them safer—and modern head clamps are strong enough to handle the most severe cuts.

Save set-up time. Milled bits can be set up in a fraction of the time required for ground knives — and with greater accuracy.

Milled bits hold cutting edge longer. The pattern is milled into the bit, thus backing up the cutting edge and supporting it in the cut, resulting in longer life. To re-sharpen it is only necessary to grind the bevel forming the cutting edge.

YA

Yates-American

BELOIT, WISCONSIN

BRANCH OFFICES: CHICAGO, ILLINOIS; HIGH POINT, NORTH CAROLINA; MEMPHIS, TENNESSEE; PORTLAND, OREGON.

See how the new Thermatron High Frequency Generator with Automatic Power Control Speeds up Edge Bonding!

Thermatron

HIGH FREQUENCY GENERATORS AND EQUIPMENT

In the installation shown, the new 20KW THERMATRON Generator is used in conjunction with a Weldon press, which is completely shielded and guaranteed to meet FCC requirements. A new automatic tuning device delivers to the load the maximum efficiency of the generator

REDUCES PRODUCTION TIME BY 33⅓% AT SENSENICH CORPORATION PLANT!

They agree at the Sensenich Corporation, Lancaster, Pa., that their new 20 KW THERMATRON and batch-type press installation is really the last word for high production edge bonding. THERMATRON'S large power capacity and automatic controls quickly proved themselves in accommodating the wide variety of loads run at the Sensenich plant.

This modern high frequency generator—product of years of Radio Receptor research and development—has indicator lights and meter readings to tell at a glance the exact status of the material in work. Power and tuning automatically adjust to load conditions during the entire cycle . . . and of course all the latest protective devices are included.

THERMATRON engineers are ready to make suggestions regarding your wood-gluing problems . . . Write us now, and request our new brochure No. WD-24.

Thermatron DIVISION

RADIO RECEPTOR COMPANY, Inc.

Since 1922 in Radio and Electronics

SALES DEPT 251 W. 19th St., New York 11, N.Y. • FACTORY 84 N. 9th St., Brooklyn 11, N.Y.

ELECTRONIC GLUING

A Survey of equipment applications

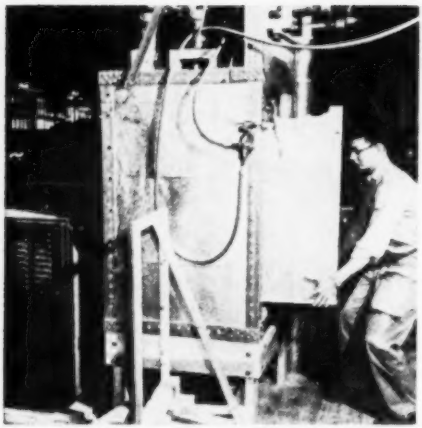
Part 6—Assembly Gluing and Electronic Gluing Adhesives

By Paul H. Graham

THERE is more diversity of electronic gluing equipment and application in assembly gluing than in any other field of high frequency bonding. Each new application is usually different in some way from any used previously. Most of the jigs, fixtures or presses used in assembly gluing are especially engineered for some particular product or part even though some equipment manufacturers now make jigs and presses that produce good results in the assembly gluing of staple products. However, practically all press and generator manufacturers maintain an engineering staff for servicing electronic gluing applications. Staff services are available to all potential equipment users to help solve their tooling and application problems. Experience gained in setting up numerous similar installations and extensive research and knowledge of the principle of electronic gluing makes this a most valuable service. Service departments of resin adhesives manufacturers also offer a similar service and the combination of the two should be adequate to solve any assembly gluing problem.

One basic operating principle which seems to be generally accepted is that a frequency of 13.6 megacycles is most effective for assembly gluing. If lower frequencies are used, it is usually necessary to operate at higher electrode voltages to obtain fast heating times. These higher voltages are undesirable since they require greater insulation and consequently greater, more complicated and expensive tooling. At frequencies above 13.6 mc., the maximum length of electrodes becomes critical unless parallel tuning is used. Therefore, there is always a tendency to run into complications when one attempts to operate above 13.6 mc.

Although pressure points warrant proper attention in assembly gluing, the chief consideration seems to be arrangement of the electrodes for bonding. These may have to be applied externally, internally, or in combination alignment in a single jig, fixture or press. It is generally conceded that electrodes should be placed in direct contact with the glue line or be located as closely as possible to it. They should also be isolated from other metal parts to prevent arcing, field distortion and power loss. The best electrode arrangement for various assembly joints has long been a principal subject of research and study by electronic equipment manufacturers and taking advantage of this experience can save a user-plant considerable misdirected tooling time and expense.



Courtesy Westinghouse Electric Corp.

Figure 1. Electronic assembly press used to assemble TV and radio cabinets at the Red Lion Cabinet Company. Pressure devices are automatic and Westinghouse r.f. generator supplies heating power automatically when door is closed to bond cabinet completely in 50 seconds.

Standard commercial presses for flat stock gluing are readily available and usually use 10 kw. or 15 kw. generator units. Other mass production items require special presses, jigs and fixtures and use smaller size units, 5 kw. to 2 kw. Conditions vary with the product and application but for most mass production operations the maximum high frequency electrode voltage used in assembly gluing for butt, dado, dovetail, dowel, miter, mortise and tenon, and rabbet joints is 2500 volts, with electrodes applied close to the glue line in external-internal combination alignment. With electrodes applied externally to the glue line, where the inside is not accessible for electrode insertion, it is 3000 volts, with the possible exception of dovetail joints, which may require as high as 3500 volts.

To estimate the power that will be required for any assembly gluing application, most authorities recommend an average value of 100 square inches of glue line per kw-minute. Cost information for suitable electrodes, pressure and power equipment may be obtained readily from electronic press and generator manufacturers.

Any discussion of electronic gluing being used in assembly operations inevitably calls for mention of the Red Lion Cabinet Company of Red Lion, Pa. This concern uses electronic gluing in any operation where it is at all practical in the manufacture of TV and radio cabinets. They are said to have pioneered the first application of radio frequency heat as applied to an entire case assembly.

At this plant, wrap-around cabinets are assembled in a single operation by the incorporation of direct glue line, stray field and through heating into one jig. Ten kw. stray field presses are used on subassembly and 5 kw. and 2 kw. presses turn out assembled cabinets. Presses designed and built by their affiliate, Redco Tool Division, are constantly adapted to new cabinet designs with the only changes required in most cases being in jig and electrode arrangement. Some 30 Westinghouse

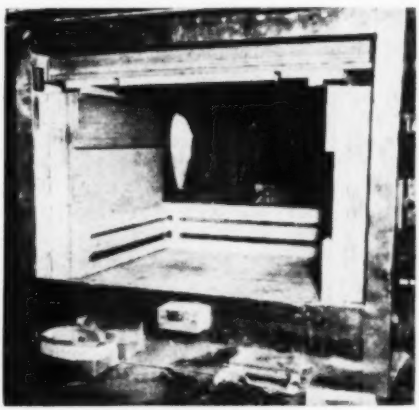
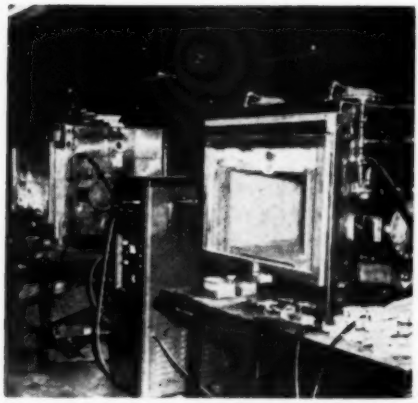


Figure 2. Electronic cabinet assembly press at Stromberg-Carlson plant uses air-operated pressure blocks for clamping and stray field type of heating.



Courtesy Girdler Corp., Thermex Div.

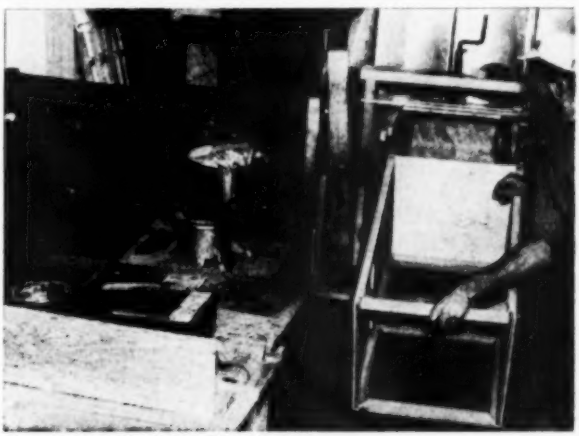
Figure 3. Two Stromberg-Carlson cabinet presses powered by 2½ kw. Thermex generator unit with double output circuit for alternate curing. Cabinet production —85 to 90 per day with each press.

radio frequency generator units are used here to supply heating power for all types of gluing jobs.

In the operation of the electronic assembly press shown here (Fig. 1) the pressure devices are automatic and the generator preset for the proper curing cycle. Subassemblies of top, sides, end, front and base are glued and placed in this clamping jig, without screws, using compressed air cylinders for required pressure to hold the joints tight and cabinets square. Radio frequency heat is applied automatically when the front is closed and in 50 seconds a perfect cabinet is ready for the final operation of assembly. Five hundred cabinets each 16-hour day is the average production at this press.

Many other manufacturers in this highly competitive field, where complete changes of design and construction may be required at intervals as short as 45 days, have made equally good use of electronic assembly presses, jigs and fixtures which permit rapid assembly without use of nails, screws or glue blocks. Jigs are generally used to carry electrodes to transmit heat and incorporate provision for the application of both end and side pressure.

Machined stock is glued and pressure is applied in the jig. The jig is placed in the electronic press where glue lines are cured by high frequency heat. The outside of the cabinet is glued to the entire frame and its glue lines are electronically set in a similar manner. TV and radio cabinets, made with up to 28 separate joints, are glued and cured by this method using simple jigs



Courtesy Westinghouse Electric Corp.

Figure 4. Assembly clamp of wood construction with lead screws used to apply pressure in three directions. Electrodes mounted in clamp cure assembly under pressure with heating power from Westinghouse r.f. generator unit.

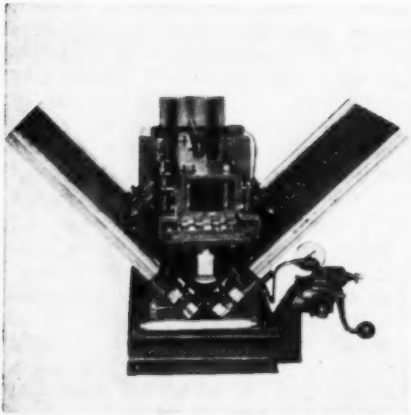


Figure 5. Raybond pressure shoe of special design for assembling frames with rounded corners of considerable radius.

and presses and provide an average 8-hour-day production of 400 cabinets in some models.

Electronic assembly presses constructed and installed at the Stromberg-Carlson Company plant in Rochester, N. Y., under direction of C. F. Van Epps, engineer in charge of the materials engineering department, use the stray field type of heating (Fig. 2) for TV cabinet assembly. Parts of the assembly are clamped and held in place by air-operated pressure blocks. Two presses are powered by a 2½ kw. Thermex unit for alternate curing with a double output circuit. Each circuit has a tuning device (Fig. 3). Cabinet production averages 85 to 90 cabinets a day for each press.

The Smith Cabinet Company of Salem, Ind., uses two electronic fixtures for the assembly of its cabinets in which wooden eccentrics are used for side pressure and air cylinders for vertical pressure. Electrodes are arranged for stray field heating and power is furnished by a 2½ kw. Thermex unit. The complete assembly cycle including loading and unloading is about 4½ minutes with two men. A complete cure of glue line is made in 1½ minutes.

The Gavan Woodcrafters, Inc., of Atlanta, Ga., is another concern which uses electronic gluing in cabinet assembly operations wherever possible. For example, in the manufacture of a radio cabinet, 3-ply fronts are molded in electronic molding presses, 4 fronts at a time, while sides are assembled in pairs in other electronic presses. Spe-

Figure 6. View of electronic frame assembly operations at Horton & Hubbard Company plant at Nashua, N. H. Four presses serviced by 3 kw. Raybond generator through two-way switch for continuous generator operation.

Courtesy Electronic Heating Corp.

Figure 7. Ukulele 3-ply body panel sections molded in molding jigs at plant of Fred Gretsch in Brooklyn, N. Y. Screw ram pressure shapes sections about molds and Thermatron high frequency generator supplies current for bonding.

cial dies are used in these presses, with sections of fire hose being used in the female mold with a copper electrode face which conforms to the panels on the cabinet. The male mold does not have the fire hose but does have a similar electrode with the same curvature conformation. A pressure of about 200 p.s.i. and power supplied by a Westinghouse radio frequency generator, connected for alternate curing, presses and bonds in automatic operation to produce four fronts in a complete cycle of three minutes or side panels in pairs in one minute.

Figure 8. Ukulele body sections glued together and bonded in special assembly jigs with high frequency.

Tops are produced in double jigs in cycles of two tops in two minutes and various subassemblies are produced in cycles up to one minute. The final assembly involves the use of special assembly jigs so arranged that one complete cabinet is produced in one minute ready for finish machining, sanding, fitting and finishing.

A very interesting method of electronic gluing of a radio-record player combination cabinet used at another plant consisted of the following sequence of operations:

1. Front panel molded of 3-ply veneer in hydraulic press to curved form and bonded with power from a 5 kw. generator. One panel made four fronts.

2. Two assembly jigs used to make subassembly with a 2 kw. generator supplying power arranged for alternate curing. Two plywood stiffeners fastened to top and bottom edges and four corner blocks applied to curved front panel—in first jig. Operation cycle, 50 seconds; with 20 seconds' heating time. Second jig—thin strip and two corner blocks fastened to record player shelf.

Figure 9. Guitar bottoms, tops and side sections glued in large hydraulic press over wooden forms and bonded by high frequency.

Operation cycle, 50 seconds; with 30 seconds' heating time. (Note how operations were balanced in total cycle time to keep generator in continuous operation.)

3. Special assembly jigs used to assemble side panels. Two rounded strips applied for curved front panel reinforcement; also one bottom edge piece and glue block reinforcement. Two radio chassis support blocks fastened to side panel. Jig placed in pneumatic press and bonded with power from 5 kw. generator. Two assemblies cured in press at same time while duplicate assemblies are prepared in other jigs for reloading. Curing time, 20 seconds.

4. Special clamp jig used to glue on top of cabinet to assemble two sides, front, back and back glue block. Assembly clamped in jig and jigs used in pairs to permit one 2 kw. generator to power both jigs through transfer switch for alternate curing. Curing time each jig, 45 seconds.

5. Final assembly: two cabinet subassemblies—front, two sides, record player shelf, back and glue blocks—placed in special assembly jigs, clamped and cured in 1 minute, 50 seconds' heating time with 5 kw. generator, using transfer switch for continuous generator operation.

Electronic assembly gluing installations in the furniture industry require special electrode arrangement and special holding clamps to suit the type of joint and shape and size of product. Various pressure members are also required in special jigs to suit the particular assembly operation. Chest ends are regularly produced at the rate of 1,000 units per day with automatic hydraulic pressure jigs and universal case clamps. Using stray field heating, with proper electrode arrangement, it is possible to produce up to 200 chest assemblies per day.

Modern furniture is assembled with special assembly jigs and cured by electronic heating at the rate of two to three minutes per assembly. Glue blocks and corner blocks are quickly and securely attached in place with electronic hand guns while assemblies are in the press.

Figure 10. Ukulele tops and sides glued and cured by high frequency current from Thermatron high frequency generator in 15 seconds.

Bonding A Roof Member of the Unisheltor Home With SYNCO H-F Adhesive at the Pressed Steel Car Company's plant, Chicago, Illinois.

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Courtesy Radio Receptor Co., Inc.

Figure 11. Final assembly of guitars where high frequency heat permanently bonds necks to finished bodies in about 10 seconds.

The entire glue line inside waterfall case tops is set up in only 20 seconds and case sides are completely fabricated with simultaneous setting of frame joints and bonding the plywood panel to the frame in the same period of curing by means of electronic equipment.

Many of these assembly gluing operations are performed with very simple press arrangements. The assembly press shown here (Fig. 4) is constructed for the most part of wood. In fact, it is more of a clamp than a press. After loading parts of the assembly into the clamp, the operator swings the arm in front of the assembly to drop it into a slot and then tightens up the lead screw for pressure. Lead screws are also provided at the top and side for applying pressure in the other two directions. Most assembly presses require pressure from three directions. The clamped assembly is finally cured under pressure by means of electrodes located to contact the glue joints with heating power from an electronic generator unit.

An interesting assembly gluing installation using commercially designed electronic equipment was observed at the Horton & Hubbard Box Company plant at Nashua, N. H. Here special pressure-shoe box presses (Fig. 5), constructed and installed by the Electronic Heating Corporation, were being used to make round cornered box and luggage frames. Four presses were serviced by a 3 kw. Raybond generator through a two-way switch, two presses connected to one side of the switch and two to the other side to permit continuous operation of the generator unit (Fig. 6). While one bank of presses was closed and curing the glue joint, operators were unloading and loading the opposite bank. This operation switched back and forth every 20 or 30 seconds.

In the assembly of these frames glue was applied to the corner molding piece, the two pieces placed in location and the molding laid on top in the press. The header was brought down and pressure was applied. With the electrodes entirely outside the frame, high

Figure 12. Union combination pneumatic and electronic door clamp open for loading. Air cylinders supply edge and end pressures up to 1,250 lbs. Adjustable stops for various size doors.

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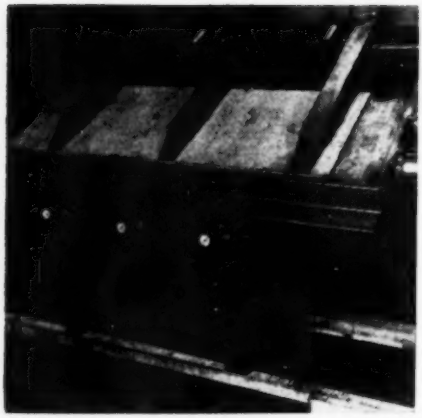

Courtesy Union Tool Corp.

Figure 13. Combination pneumatic and electronic door press closed for bonding with radio frequency current from 2 kw. Westinghouse unit.

frequency heat was turned on and the glue set in 20 to 30 seconds. The construction of these frames was such as to permit the fabrication of finished luggage with considerable radius at the corners, as well as with heavier side walls and more rigidity as compared with thin curved plywood sometimes used for this purpose—and at a much lower fabrication cost.

A sequence of assembly electronic gluing operations, quite different but no less interesting, is used in the woodworking department of Fred Gretsch at Brooklyn, N. Y., where musical instruments of top quality are produced in volume lots. In the fabrication of guitar and ukulele bodies, for example, 3-ply body panel sections are first molded in a series of molding jigs with hydraulic or screw ram pressure and cured with a high frequency current (Fig. 7). These are usually double-width panels. Two of these half-panel sections, with their ends properly cut for joining, are then glued together and cured in special assembly jigs by high frequency to form instrument sides (Fig. 8). These side assemblies are cut in half to make two instruments after the bonding operation.

Guitar tops, bottoms and side sections are glued together in a large hydraulic press over special forms and cured by high frequency (Fig. 9). A smaller hydraulic press unit is used to glue and cure the ukulele assembly (Fig. 10). Curing time takes about 15 seconds. The last step in the body assembly involves the application and gluing of the necks to the finished instrument bodies in special clamping jigs (Fig. 11). High frequency heat bonds these parts permanently in about 10 seconds. This job was engineered with the assistance of the Radio Receptor Company, and Thermatron high frequency generator units are used to power jigs and presses for bonding.

In an aircraft plant, small assemblies with flat joints are usually assembled on special jigs equipped for electronic heating. These jigs are set up on tables to permit a single portable high frequency generator of 1 kw. rating to service the table jigs in continuous rotation. Insulated Masonite tops have been applied over the tables and clamping is performed with stubs affixed to these tops. One stud in each group

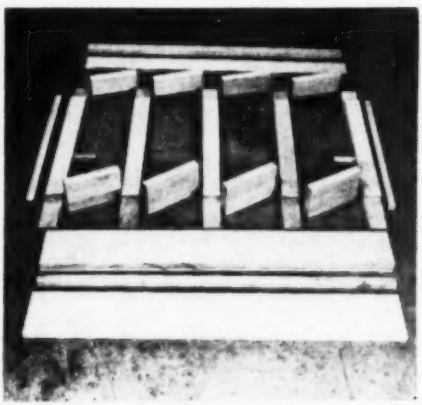

Figure 14. Components of 20-piece piano back assembly before gluing together.

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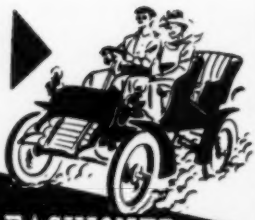

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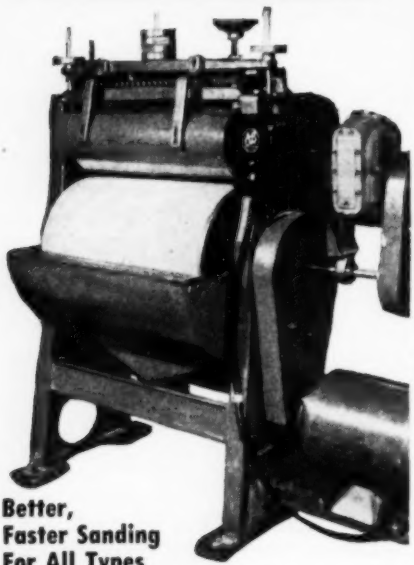

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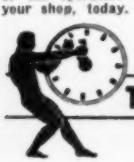

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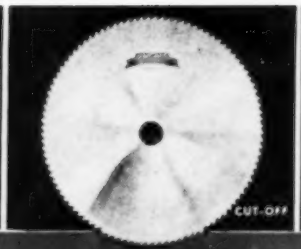
Figure 15. Pressure applied to back assembly with screw clamps. High frequency current from Thermex unit cures assembly at temperatures of 190-200° F. in about nine minutes.

makes contact with one electrode and makes a connection below the table top with a copper tube leading to the generator. One electrode of each pair rides a thin wood backing attached to the panel while the other is located on the underside of a wooden block applied to the top of the assembly and below steel cross straps.

Clamping pressure is applied by screwing down cranked handle nuts on the studs. Wire jumpers connect to upper electrodes and to the generator through a control box. When the joints are glued and assembly has been made and clamped, the portable generator is connected and turned on to cure the joints. Total operation time, including curing, is about 30 minutes as compared to 8 hours required by the former cold pressing methods used for this assembly.

A combination pneumatic and electronic door clamp, manufactured by the Union Tool Corporation of Warsaw, Indiana, was seen in operation at a large sash and door plant which was producing 400 frame doors per 8-hour



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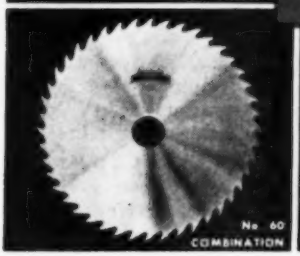

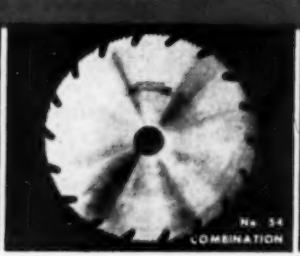

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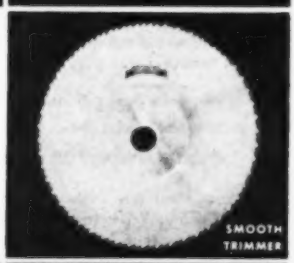

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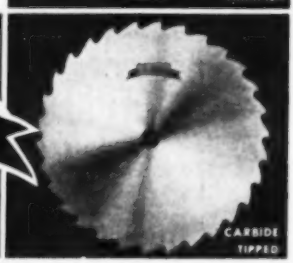

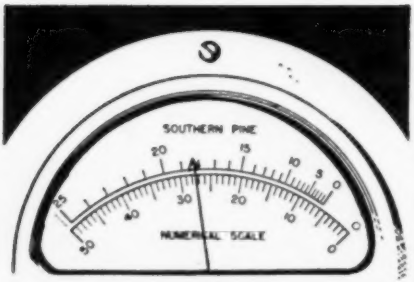

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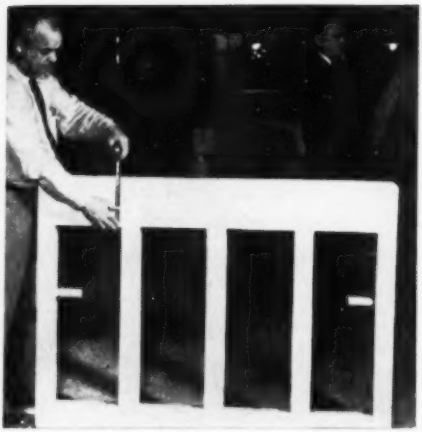

Courtesy Girdler Corp., Thermex Div.

Figure 16. Finished bonded piano back assembly is dimensionally stable and has superior strength.

day with one operator. Electronic heating current was supplied by a 2 kw. Westinghouse generator unit. Doors were clamped by means of air cylinders.

Pressure was applied on all sides and also on the face of the door. Pressure along the length of the door was provided by two air cylinders with a total pressure capacity of 10,000 pounds, and another pair of air cylinders provided pressure along the width of the door with a total pressure capacity of 1250 pounds. Total air consumption for each clamping cycle was approximately 1900 cubic inches of compressed air. Adjustable stops were provided at this press which permitted handling finished doors from 2½′ to 3′ wide and from 6½′ to 7′ long. Rough door capacity was ½″ over the finished width and 1¾″ over the finished length (Figs. 12 and 13).

Mention has been made previously of electronic gluing methods used in the manufacture of piano parts. An equally interesting assembly gluing operation is a method used to fabricate a piano back assembly, including the pin plank. The 20 parts of the assembly (Fig. 14) are

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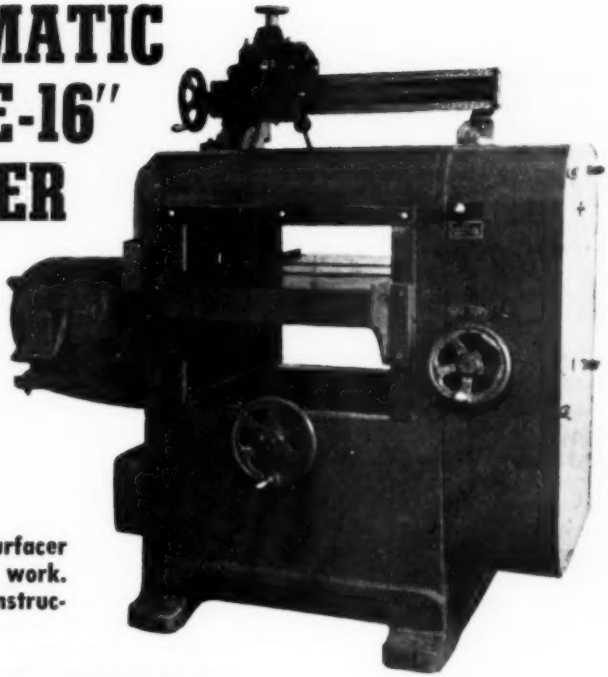

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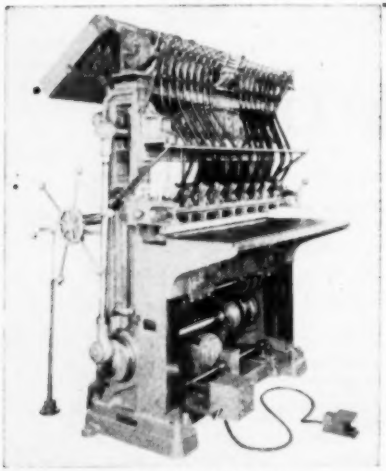
first glued and laid up in the clamp press with two stainless steel strips placed so they cover the frame, top and bottom, to serve as electrodes. Pressure is applied to the frame assembly with screw clamps (Fig. 15) and high frequency current is turned on from the generator to cure the assembly at a temperature of 190-200 degrees F. After a curing period of about nine minutes and a soak period of about two minutes, the bonded back assembly is ready for machining (Fig. 16).

Electronic Gluing Adhesives

Electronic or high frequency heating requires the use of synthetic resin glues. Without these glues electronic gluing would not be available to the woodworking industry as it does not seem to work with animal glues to advantage. The four basic types of resin glues in common use are urea-formaldehyde, phenol formaldehyde, resorcinol formaldehyde and melamine formaldehyde. These glue types are often varied in their formulation by the manufacturer for different gluing jobs and are sometimes used in combination to provide a particularly desired property or properties not contained in a single glue. For example, melamine is sometimes used to fortify a urea glue to meet special gluing conditions.

After listening to a number of complaints regarding electronic equipment and glues used in high frequency heating and then hearing the other side of the story from the adhesives and electronic equipment manufacturers, my feeling in the matter coincides with a statement made before a wood industry group by Paul D. Zottu, president of the Electronic Heating Corporation, in commenting on some of the troubles encountered with electronic gluing in the woodworking industry:

"Some of the trouble with electronic



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heating lies with the difference between resin glues and animal glues. If there are poor joints, animal glues fill the gaps but resin glues do not—and high frequency heating requires resin glues. The best cold setting urea types for high frequency heating are not good gap fillers. As a result, machining difficulties build up. More pressure is used to correct these machine deficiencies. This leads to starved joints and crushing. There is a tendency to accept joints as they come off the machine as if perfect because the electronic equipment operator does not have time to inspect the stock. I believe that most electronic gluing troubles would be eliminated if stock were properly prepared."

Some troubles are also due to lack of close cooperation between the user-plant and the equipment and adhesives manufacturers. In the words of E. S. Winlund, electronic engineer for Westinghouse:

"Every so often a newcomer purchases a generator for a specific application and refuses to take advantage of the electronic manufacturer's national experience with the same or closely allied applications. With the idea that he is saving money he proceeds to spend months getting the bugs out of the process, when a week or two would have done it with competent engineering help, based upon previous experience."

Many service engineers representing various resin adhesive manufacturers reported similar experiences with plants using their glues in electronic gluing operations. Promiscuous use of catalysts, extenders or electrolyte materials to improve on the manufacturer's glue formulation can only lead to trouble. Most reputable resin adhesive manufacturers continue to follow up the performance of their glues and do not consider a sale complete until the glue is functioning to the satisfaction of their customers. Their technical representa-

DEDGIE the Planer Boss says:

"House cleaning season began early this year—about January 20."

It's also a good time to get ready for fast cutting and high production by ordering

DETROIT KNIVES

PLANER—MOULDER

VENEER—CLIPPER

SHAPER STEEL

Leading mills and Manufacturers throughout the U.S.A. use DETROIT knives regularly because of their fast cutting and long edge-holding. Make your next order DETROIT—you'll be glad you did.

Better Knives

Since 1885

DETROIT EDGE TOOL CO.
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Sharpens, bevels each tooth as it comes along

ONLY Y 18 HAS THE AUTOMATIC SWIVEL

Only the Y 18 can sharpen cross cut saws in one operation. Automatic swivel enables each tooth to be sharpened as it comes along. Eliminates a second set up. Every bevel is uniform, all points balanced. Sharpens rip saws too. Write for details of Y 18.

The Wardwell Mfg. Co.
3161 Fulton Road
Cleveland 9, Ohio

AC 38 CIRCULAR SAW SETTER

Sets teeth at a speed of 150 to 200 per minute on saws with diameters from 5" to 38".

WARDWELL

Maker of largest line of saw and tool sharpening machines

tives live with the installation during the early adaptation stages and later follow up full-scale operation to make certain that the glue is being handled properly to assure steady creditable performance of their glues.

There is no doubt but what some of the fine commercial resin adhesives currently available for electronic gluing of wood parts and products were not covered in this survey. Those glues which were observed in this study of electronic gluing equipment and methods included the following, listed by trade name and company rather than by type of glue manufactured:

Aerolite—Ciba Company, Canada
Amberlite and Uformite — Resinous Products Division, Rohm & Haas Company, Philadelphia, Pa.
BC (number series)—Bakelite Corp., New York, N. Y.
Casco-Resin—The Borden Company, New York, N. Y.
Catalin—Catalin Corp. of America, New York, N. Y.
Knicobond—National Casein, Riverton, N. J.
Lauxite—Monsanto Chemical Co., Springfield, Mass.
Melurac and Urac—American Cyanamid Co., New York, N. Y.
Penacolite—Koppers Co., Inc., Pittsburgh, Pa.
Perkins—Perkins Glue Co., Lansdale, Pa.
Plaskon—Plaskon Div., Libbey-Owens-Ford Co., Toledo, O.
Plyamine—Reichhold Chemicals, Inc., New York, N. Y.
Synco—Snyder Chemical Corp., Bethel, Conn.
Synvarol—Synvar Company, Wilmington, Delaware.

As this is just a use-report there will be no attempt to select any best resin adhesive manufactured by any commercial glue supplier for any particular electronic gluing application, nor will the technique of handling resin ad-

hesives be discussed. The first must be left to users' preference and the latter is best described by the manufacturer's instructions, as he knows how his glue is made and what it can do under given conditions of application and operation.

The four basic types of resin adhesives used in electronic gluing are:

1. Urea-formaldehyde, which relies on polymerization of the resin by catalytic action for adhesion: accelerated by heat.

2. Phenol-formaldehyde, which relies on polymerization of the resin by heat for wood bonding.

3. Resorcinol-formaldehyde, which provides durable adhesion by means of heat to complete the resorcinol-formaldehyde reaction at rapid rate of set.

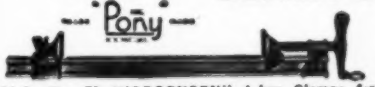
4. Melamine-formaldehyde, which relies on polymerization for adhesion, usually by heat and catalyst.

These basic types of resin adhesives are varied in their formulation and application for various gluing conditions and requirements with various catalysts, extenders and hardeners. They are also used in combination-formulation to improve certain properties. For example, urea formaldehyde resin adhesives are often fortified with melamine or resorcinol-formaldehyde resins for improved resistance to high temperature and humidity. Resorcinol-formaldehyde resins are mixed in various proportions with phenolic adhesive resins, with the increase in resorcinol resin addition reducing the setting temperature proportionately.

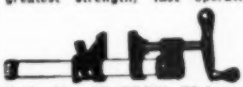
During the course of this survey urea glues were observed in use for all kinds of electronic gluing operations, from edge gluing to assembly gluing, varying in formulation according to application. Phenolic glues were used for edge gluing, end gluing, laminating and assembly gluing. Plywood was molded with resorcinol glues, which were also used for edge and end gluing and for

"Jorgensen" CLAMPS

"Pony"



Style No. 70 "JORGENSEN" I-bar Clamps for greatest strength, fast operation, and economy.



Style No. 50 PONY Fixtures make ideal bar clamps on black pipe—any length.

"JORGENSEN" "C" clamps are built to take hard service, at low cost.

Genuine "JORGENSEN" Handscrews — hard maple jaws, steel spindles. You can depend on them.

ADJUSTABLE CLAMP COMPANY
"The Clamp Folks"
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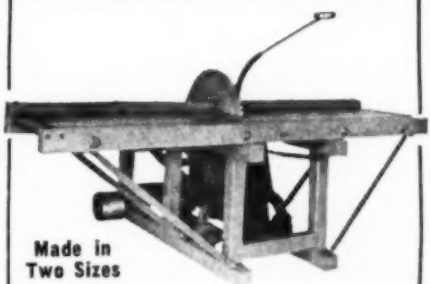
ENTERPRISE IMPROVED
UNDERSWING CUT-OFF SAWS



Made in Two Sizes

"STANDARD" and "HEAVY DUTY"

Write for Lumber and Log Calculator

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SUBSIDIARY OF WM. K. STAMETS COMPANY
MACHINERY BUILDERS & ENGINEERS
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exterior laminating and assembly jobs. Phenol-resorcin glues were seen in use on many critical gluing jobs. Melamine glues were being used for end and assembly gluing and other applications where price and slow curing were not critical considerations.

Urea-formaldehyde glues were generally accepted to be the most versatile and best suited to electronic gluing operations and were particularly attractive from the cost standpoint. Resorcinol-formaldehyde and melamine-formaldehyde glues were used successfully in many applications, but generally required more power to effect a cure. These glues were commonly used where greater water resistance was required than could be obtained with a urea glue.

During the early part of the survey it seemed to be the general opinion that phenol-formaldehyde glues were not suitable for electronic gluing because of their tendency to arc and the high curing temperature required. From that point on, however, acid-catalyzed phenol resin glues were observed in use in many plants which seemed to be producing very satisfactory results in all kinds of electronic gluing operations. Phenol-resorcin glues were also used quite extensively—particularly in the fabrication of military constructions and products for overseas use.

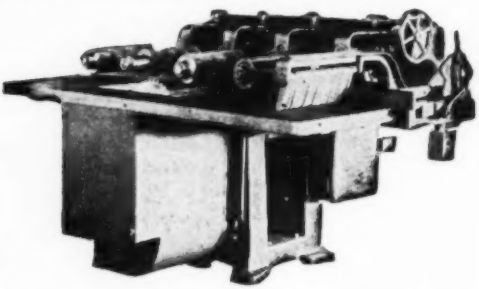
Our observations proved beyond any doubt that commercial resin adhesives manufacturers have done a fine job of developing adhesives which permit maximum efficiency in electronic gluing. Significant progress has been made in the improvement of electrical characteristics. This is most important as it is the adhesive which affords the chief power consuming load on the high frequency or radio frequency generator used in electronic gluing. Fully as significant also are the preliminary engineering and continued service supplied

A Real Husky

No. 213 A MODERNIZED HOOSIER SELF FEED RIP SAW

FOR QUICK OPERATION — DEPENDABLE PERFORMANCE

This sturdy unit is designed specifically for high speed ripping of stock longer than 24" and as a gang ripper for stock as short as 12". The No. 213 is equipped with a stationary table top having all feed works brackets bolted to the top—as is the gear reduction drive. The mandrel rides on ball bearings and is raised and lowered quickly by a hydraulic cylinder. Eight driven rolls feed the stock through the saw at high speed. A 50 H.P. motor drives this unit at full capacity. The No. 213 is a real workhorse, built to handle your toughest jobs. Available for direct motor or V belt drive.



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DESIGNED FOR THE TOUGHEST RIPPING JOBS

SINKER-DAVIS CO.

230-250 SOUTH MISSOURI ST. DEPT. 0

INDIANAPOLIS, INDIANA

to the user-plant by both the adhesive and electronic equipment suppliers.

Conclusion

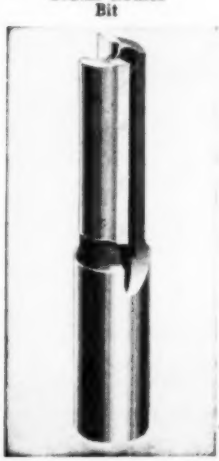
Electronic gluing—with all its early adverse history, during a period when it was plagued with numerous problems and sales resistance—has advanced to the status of a most efficient and economical method of wood gluing through the cooperation of users and adhesive and electronic equipment manufacturers in the solution of their various problems. Most of the old problems have been solved and new problems are now readily recognized and quickly solved with applied research and the background of national application experience.

User-plants and operators have responded to the continued constant campaign of instruction in proper use and stock preparation education. Adhesive suppliers have improved their manufacturing and formulation techniques to a point where they are now able to supply the proper adhesive to meet any given condition or combination of conditions. Electronic equipment manufacturers have worked most of the bugs out of their power and pressing equipment and their engineers have acquired extensive experience background as an aid to better technical service. Finally, the results obtained in plants using electronic equipment and resin adhesives have caused more woodworking plants to adopt electronic gluing for lower cost, faster production, less labor, substantial materials savings, improved quality of product and a host of other proven advantages.

A fish is an underwater creature that grows fastest between the time it is caught and the time the fisherman describes it to his friends.

O. C. E. TRIMMERS ROUTER BITS

O.C.E. Router Bit



Solve the problems encountered in working formica and other plastic covering with CARBIDE TIPPED O.C.E. Tools.

Trimmers—Fit any $\frac{5}{16}$" router spindle. Straight face for flush trimming or 10° taper for self edging.
Router Bits—Double flute $\frac{5}{16}$" to 1" cuts.

Clean, fast trimming of linoleum, plastic, veneer, etc., after gluing. No other finish necessary.

Dealers In Principal Cities

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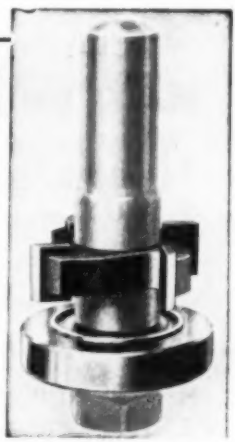


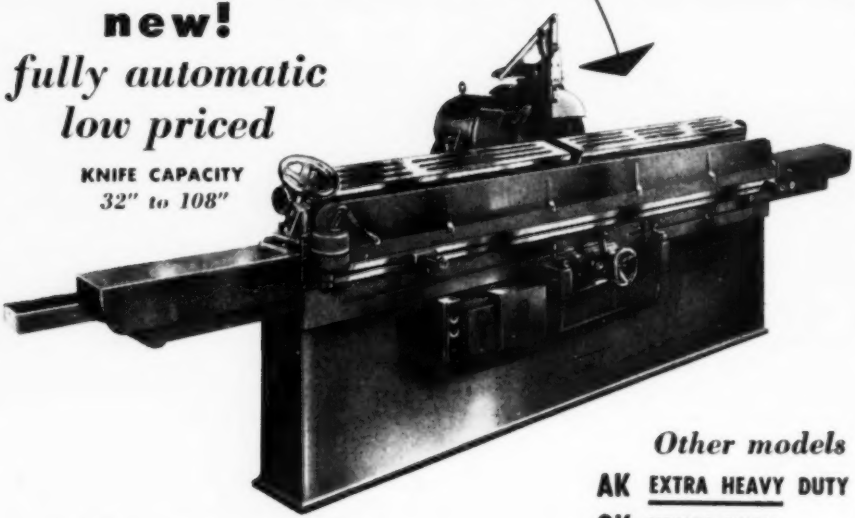
O.C.E. Trimmer and ball bearing roller guide. (Spindle not included)

HANCHETT MODEL DN knife grinder

new!

fully automatic
low priced

KNIFE CAPACITY
32" to 108"



Other models

AK EXTRA HEAVY DUTY
GK HEAVY DUTY

Model DN Features:

1. Timing belt drive. Positive — quiet — non-slipping.
2. Eliminates all gears (requires no lubrication).
3. Free from vibration and reversal shock.
4. 100% Anti-Friction Bearings.
5. Precision ground ways for accuracy.
6. Guarantees perfect machine alignment.
7. Force feed lubricated ways.

FINEST KNIFE EDGES

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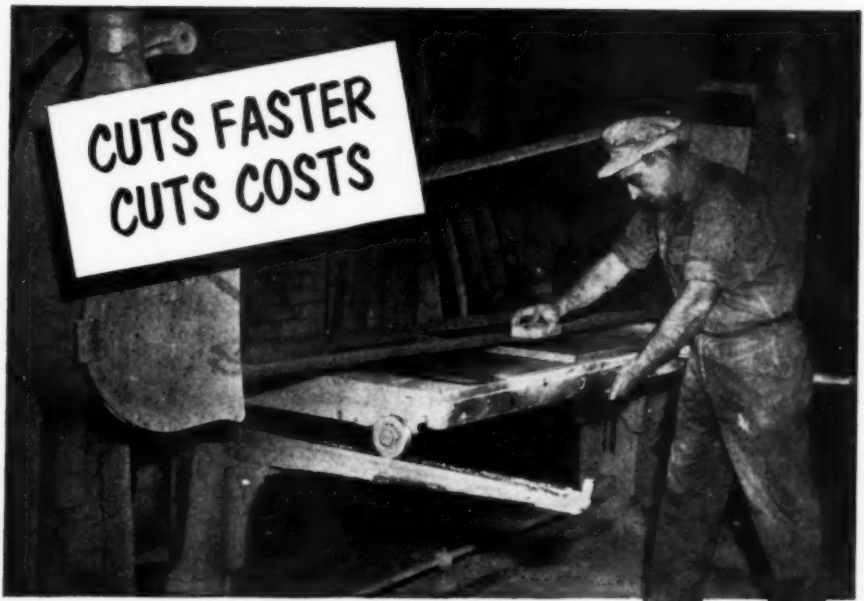
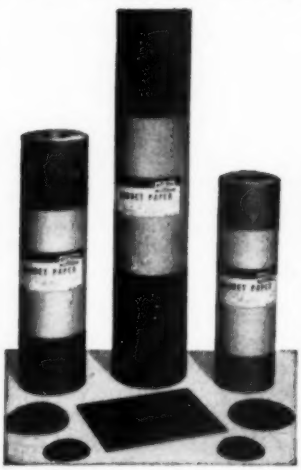
World's Largest Manufacturer of Knife Grinding and Saw Sharpening Machinery

MAIN OFFICE — Big Rapids, Michigan **WEST COAST** — Portland, Oregon



"On the JOB" tests show savings over premium priced abrasives...



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Customers tell us that "on the job" tests have proven Mid-West Resin Seal Garnet to be superior to other coated abrasives costing much more. That is why we urge you to make a test run with Mid-West and compare it with the brand you are now using.

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Perkins is headquarters for HIGH FREQUENCY GLUES

The excellence of high frequency equipment for many operations is a proven fact. If you aren't getting the best possible results, it may be that you do not have the proper glue formulation. This can easily be determined through a free and unbiased investigation by the High Frequency Section of the Perkins Technical Service Division.

Since Perkins Glue Company offers five different formulations for use with high solids liquid urea resins, plus several others for use with low solids resin and powdered resins, you can be sure that the glue-catalyst offered you will be best for your operation.

Whether you now have high frequency equipment or are thinking about trying it, return the coupon below for Perkins Summary of Adhesive Combinations for perpendicular, parallel and stray field heating. It's a step in the right direction!

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(PLEASE ATTACH TO YOUR LETTERHEAD)

WOODWORKING PLANT *Provides New Hope*

By David Markstein

THE place is the delta country of northern Mississippi—rich, flat, black land where folks for generations have been raising some of the south's finest cotton. But in Sledge, a tiny town plumped in the heart of the delta, prosperity is growing, not on cotton stalks, but from raw wood, turned by skilled refugee hands into fine furniture.

A Mississippi delta cotton planter and a handful of displaced European war victims have, despite different customs and language barriers, reached a common understanding which is proving a profitable venture for both. The venture—modern furniture factory—probably never would have been undertaken had it not been for the migration of labor from the plantations to the industrial centers of the north.

The man responsible for the project—Latvia Furniture Manufacturing Company—is Harry Howze, a graduate in agriculture from Mississippi State College, manager of a 1500-acre plantation, and an aggressive young man in his 30's whose sales ability has sparked the 3-year business into its modest but rapid success.

Howze returned to Sledge in 1942. Cotton at that time was the principal crop. Shortly after the war, however, Negro tenants started drifting north, as was the case in many other sections of the delta. By 1948 the farm labor situation had become so acute that a neighbor of Howze, A. T. Calicott of Senatobia, decided to transport several hundred Latvians to Mississippi as farm laborers. Howze, quick to recognize the possibility of solving the labor problem, offered in the spring of 1949 to assume responsibility for 25 of the families with the provision that they remain with him for a year's trial.

The bewildered, fear-ridden refugees, who fled their homes first at the German invasion, then from the Russians, arrived in New Orleans with little more than the clothes they wore. A few spoke broken English. Howze met them, gave them their first welcome to America, and took them to their new homes at Sledge.

The farmhouses which had been occupied p r e v i o u s l y by tenants were turned over to the newcomers. Howze agreed to furnish all materials and tools, provided the occupants would fix up their own homes.

"Most of them," Howze says, "put in new floors, papered the ceilings and prettied up the interiors. All of them immediately went to work to break ground for small gardens.

"Those folks can raise more on an acre of ground than we ever dreamed possible," Howze declares.

That first year the Latvian tenants worked long and hard to produce cotton. This crop was entirely alien to them and especially difficult for a people unaccustomed to rigorous toil under a broiling sun.

Harry Howze (seated), who engineered the growth of Latvia Furniture Manufacturing Co., confers with plant manager Charles Povosils.

"They just weren't inclined toward the type of farming we do in the delta," Howze relates. "They were used to dairying and livestock."

Most of them became discouraged after the first year, and none of them was inclined to remain idle during off-season periods. Howze sensed their restlessness and decided to do something about it. Shortly after their arrival he had noted that many of the Latvians showed exceptional skill in woodworking, in repairing machinery and in designing novelties and furniture.

"They had made furniture for their homes; they could tear down an automobile and reassemble it; and were always coming up with interesting new novelties, such as telephone—'gossip' stands, inner closet door racks for men's clothing and similar gadgets," Howze recalls.

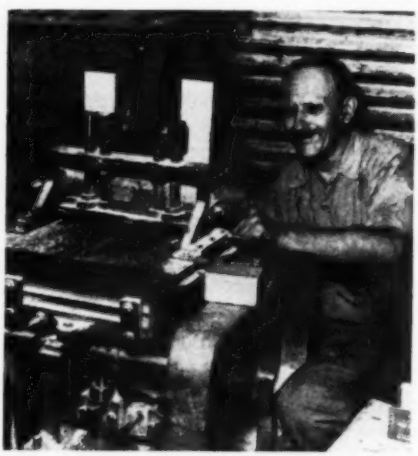
"So, I decided to set up a simple woodworking shop in the back of the commissary, more to give them something to do between seasons than for any other reason."

At first Howze encouraged his friends and neighbors to give their repair work —furniture, screens and doors, and other odd jobs—to the Latvians. He agreed to let them make whatever profit they could from such work.

Soon Howze discovered that he had uncovered some excellent craftsmen. One was 70-year-old Adolfs Jacobson Povosils, a master craftsman in his native Latvia—which requires a 20-year apprenticeship—who had previously operated a plant of his own manufacturing custom-built furniture.

His son Charles, who also had learned the trade, showed excellent promise and had the additional advantage of being able to speak English with reasonable ease. Four other members of the original group showed interest, and soon the odd jobs had developed into orders for store fixtures and bank interiors. They also made a few novelties which were distributed locally.

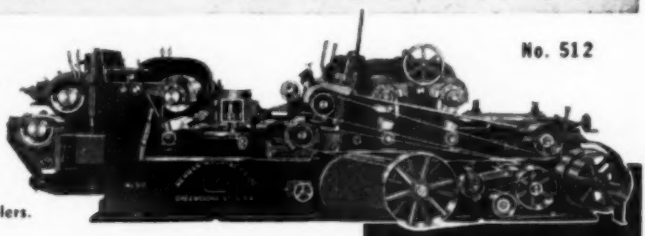
"I soon realized, however," Howze recounts, "that I was either going to have to get into the manufacturing



A master craftsman in his native Latvia, Adolphs Jacobson Povosils, 70, is one of the key men in the Latvia Furniture Manufacturing Co.

NEWMAN MACHINES

Newman

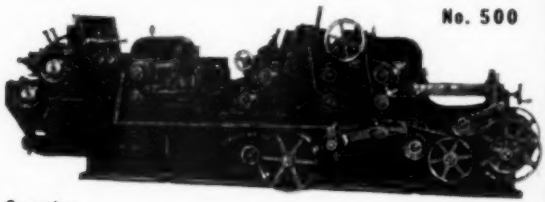


No. 512

Capacity: 16" and 24" wide, 8" thick.
Speeds up to 325 feet per minute.
8" dia. cutting circle.
Six 12" dia. feed rolls.
Single and double profilers.

BALL and ROLLER BEARING PLANERS AND MATCHERS

No. 500



Capacity:
14" and 24" wide, 6" thick. Speeds 40 to 200 feet per minute. 7" cutting circle. Six alloy steel feed rolls. High carbon special alloy steel cylinders. Single or double profilers.

The ball bearing NEWMAN 71 (shown below) will grind all sizes of cutter heads. Table is 33" long by 9" wide with horizontal travel of 25" and is heavily ribbed to maintain accuracy over entire travel. Maximum cutter head swing is 11".

HEAD GRINDER No. 71

ORDER NOW FOR EARLY DELIVERY

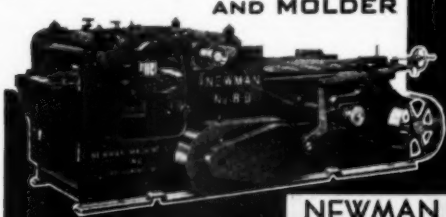
Ball and Roller Bearings

ALL NEWMAN cylinders or heads are DYNETRICALLY BALANCED insuring an accurate and superbly finished product.

No 55 AUTOMATIC PINEAPPLE FEED TABLE

The NEWMAN 55 feeds stock automatically to high speed planers and matchers up to 450 lineal feet per minute. Capacity: 30" wide, 8" thick. All adjustments and controls are centrally and conveniently located.

No. 8-B PLANER, MATCHER AND MOLDER



Unsurpassed for work in small and medium mills

The NEWMAN 8-B planes 22" wide and 8" thick, joints 4" thick and will match 14" wide. 6" diameter feed rolls. Speeds of 30, 50 and 75 feet per minute.

MAY WE SEND YOU FULL DETAILS?

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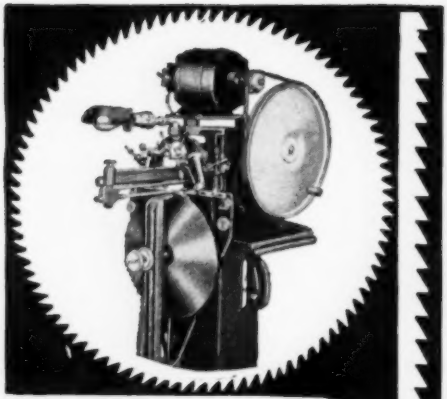

Your SAWS
are no better than your
SAW FILING

Inaccurate saw filing can ruin the cutting efficiency of the best saws, perhaps crack or break them. The machine precision of Foley Saw Filing can increase your sawing output 25% to 40%. The Foley *automatically* joints the saw as it is filed, making all teeth uniform in size, height, spacing. Foley-filed saws run cooler, cut fast, do beautiful work — and stay sharp longer.

The Foley is the ONLY machine that files cross-cut circular saws, band saws, hand saws.

30-DAY TRIAL of the Foley Saw Filer is offered—to show you what a difference Foley-filed saws can make.

FOLEY *Automatic* SAW FILER

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Minneapolis 18, Minn.

Please send literature on the Foley Automatic Saw Filer and details of your 30-Day Trial.

Name.....

Address.....

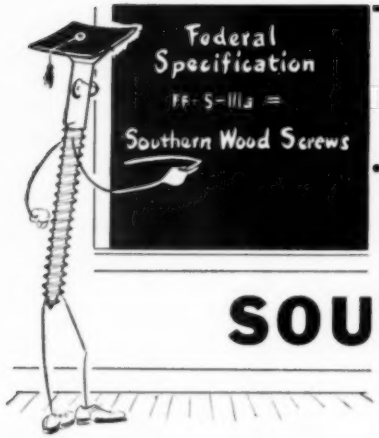
Bruno Kalins, native Latvian, sprays a finished desk.

business, or give up the idea of having a hobby shop in the back of my store. Business was growing too fast."

At that point Howze saw a survey of the National School Service which pointed out that 600,000 desks would be needed for school classrooms during the next five years, a demand exceeding the output. He and six associates launched into the manufacture of desks for students, teachers, and school principals, utilizing the supply of oak to be found in Mississippi and nearby Tennessee.

The hobby shop moved to a 40-acre site at the edge of town, and then into a Quonset-type structure equipped with machinery for turning out all-wood desks. Arrival of defense orders after that necessitated additional space. At one time there were 80 workers.

Today the plant employs 25 workers, with Charles Povosils, the master craftsman's son, in charge. The five original Latvian workers have the key jobs. The firm's annual payroll runs approximately $200,000. Desks are being shipped to 45 of the 48 states.



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WOOD
SCREWS
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Whenever it is required that wood screws meet the exacting Federal Specification FF-S-111a, manufacturers have a habit of simply using Southern Wood Screws.

For Southern Wood Screws are designed especially to meet this specification . . . and to provide the most in holding power. Uniformly made of the highest quality materials in one of the most modern plants of its kind, Southern screws are of Government-approved *single thread* construction . . . accurately machined . . . with *precision milled* slots, *full size* shanks and sharp *gimlet* points. Fast starting Southern screws bite cleanly into the wood without tearing fibres, *and hold tight*—making your product stronger, longer-lasting.

Wide range of sizes from 3/16" No. 0 to 6" No. 30—in steel and brass. Write today for interesting literature on types of wood screws—and for the Southern Wood Screw catalog.

SOUTHERN SCREW COMPANY
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STATESVILLE, N.C.

Southern Wood Screws

FACTORY WAREHOUSES
4100 Dell Avenue
North Bergen, N. J.
641 Stewart Ave., S.W.
Atlanta, Georgia
325 W. Ohio Street
Chicago 10, Ill.

All but two of the 12 families now living in Sledge have moved into town, and only one of the original families is still attempting to farm in Mississippi's delta.

They all have new automobiles, have built their own church of the Lutheran faith at Senatobia, making the pews in the Sledge plant. The fear they showed toward strangers upon arrival three years ago is rapidly giving way to a new look of hope.

SOUTHERN PINE ASSOCIATION MEETING

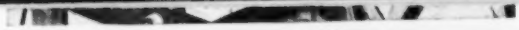
Centered around the 38th annual meeting of the Southern Pine Association, the S.P.A. Machinery and Equipment Exposition on April 8-10 will feature displays of more than a million dollars worth of equipment and machinery used in manufacturing, logging and millwork. Most of the meetings will be held at the New Orleans Municipal Auditorium, site of the machinery show.

ONE OF 12 WOOD-LOK* FEATURES

ONLY 20 MIN. CLAMPING TIME

for joint assembly operations that normally require 6 to 8 hours.

WOOD-LOK* Glue will shorten your assembly lines... free working floor space . . . speed production. It is the only type of resin wood glue that can be handled and machined after a clamping time of 20 to 30 minutes. It sets with a speed comparable with hot animal glue



to be added, cooked or heated. Its characteristics never change,

20 to 30 minutes. It sets with a speed comparable with hot animal glue

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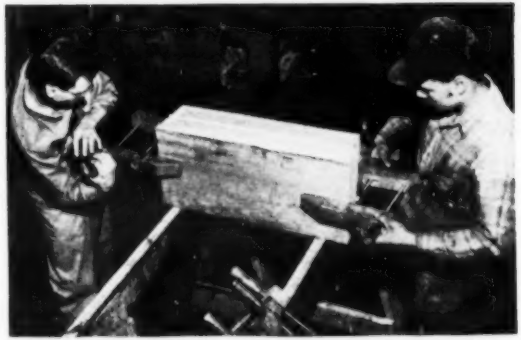
(*Reg. applied for)



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Headquarters FOR HARDWOODS

American WOODS

By reader request we are continuing the listing of American woods which we began in our Directory Issue (October).

We plan to continue this listing until we have covered all of the most popular woods. Then the entire series will be reprinted in booklet form for those wishing copies. Let us hear from you if you wish us to reserve a copy in your name.

CASCARA BUCKTHORN

Used for the Ark of the Covenant

Rhamnus purshiana, DE CANDOLE

Habitat—This tree grows from the Puget Sound region of British Columbia and Washington southward into central California. It also is found in northern Oregon and extends eastward through northern Washington to the Bitter Root mountains of Idaho and to Flathead Lake in Montana.

Locally called bearberry, chittim, bearwood, coffeeberry, coffeetree, bitterbark and wahoo, the U. S. species was discovered by the Lewis and Clark expedition in Montana, 1805-06.

Growth and Appearance—Usually a medium sized tree 20 to 40 feet high and 6 to 15 inches in diameter, it has been observed with diameters of 2 to 3 feet. Open-grown trees have short stubby trunks and thick bushy crowns, with numerous large upright limbs. The bark is one-tenth to one-fourth of an inch thick, ranges in color from dark brown to ashy gray, and is broken on the surface into short, thin scales. The bark has been used as a laxative. Large numbers of trees are destroyed, chiefly because the tree is not cut down after its bark has been peeled.

Availability and Use—Stumps sprout vigorously and produce from 4 to 15 stems. For this reason there is no dearth of wild bark at present. However, the demand is growing even in competition with synthetic products; and each year the bark gatherers must go farther and farther back into the mountains. Plantations have been attempted on a small scale, but so far have not proved feasible.

Cascara bark is considered one of the most important natural drugs produced in North America. The bark is collected during the growing season, from early spring and as long as the bark will slip off, which is usually from about the middle of April until the end of August.

JACK PINE

Most Northern of all American Pines

Pinus banksiana, LAMBERT

Habitat—This tree grows well in the light sandy soils and heavy snow country of the north. Jack pine grows throughout northern New England, northeastern New York, the greater part of the Lake states and south as far as the Illinois shores of Lake Michigan. In British Columbia the range lacks scarcely 300 miles of being transcontinental, extending from the southern shores of Hudson Bay to the upper waters of the Mackenzie River.

Growth and Appearance–The Jack pine is generally considered an inferior tree. It is scrubby and dwarfed on its outer limits of distribution. Under favorable conditions it may attain a height of 25 to 60 feet and breast-high diameters of 8 to 20 inches. Jack pine is essentially a pioneering tree in that it follows closely after lumbering operations and fires. During the first 20 to 25 years, it grows faster than either red pine or white pine.

The needles are stubby and flat, grayish-green in color. The creamy sapwood surrounds the brownish-yellow heartwood, which doesn't have too much strength. It is brittle and decays quickly when in contact with the soil.

Availability and Use–Its chief value lies in its ability to grow quickly as a pioneer tree. It is used locally for fuel and rough lumber. There are increasing demands for its use as pulpwood, packing cases, slack cooperage, mine timbers, posts and light traffic railroad ties.

LIMBER PINE

Flexible Twigs Can Be Tied in Knots

Pinus flexilis, James

Habitat–Limber pine is one of the smaller white pines. It grows singly or in small groups throughout the higher eastern slopes of the Rocky mountain region from Alberta and Montana to western Texas and northern Mexico, westward into Nevada and southern California.

Growth and Appearance–This is one of the "five-needled" pines. It grows slowly: the tree usually takes 200 years to attain a 10" diameter. It often reaches heights of 80 to 100 feet. As one might suppose, the name "limber" is given this tree because its branches and larger twigs are so flexible that they can, in many instances, be tied in knots without breaking. It is a low, many-branched tree. Distinctly regular whorls of slender, tough branches stand out at right angles to the main trunk of smaller trees, and may extend to the ground. Larger trees have extremely long branches which bend gracefully toward the ground. The outer ends of the branches of the upper crown tend to assume a vertical position, giving a peculiar up-reaching effect.

Availability and Use–The wood is occasionally used for rough construction lumber, as well as for log cabins, fuel and mine props. The principal use is for fuel. There is no record of the amount cut or the volume of standing timber.

Pure stands of limber pine are sometimes found, but it is more common as an individual, or in small groves in mixture with mountain hemlock, and others. Young trees, especially, suffer heavily from surface fires, but the long tap root and the flexible limbs make all limber pines resistant to wind damage. It is not suited for forest planting, but its slow growth and unusual outline resulting from the horizontal and pendulous branches indicate possibilities for landscape use.

LONGLEAF PINE

For Pitch, Turpentine, Tar and Resin

Pinus palustris, Miller

Habitat–The temperate, almost subtropical climate, combined with ample rainfall of the coastal plain from southeastern Virginia through North and South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana and eastern Texas, furnishes desirable growing conditions. Trees of best development are found on moist but well-drained, deep, sandy loam, but they grow well on all sandy and gravelly soils within this range.

Growth and Appearance–Longleaf pine frequently grows to heights of 100 to 120 feet, with a tall slightly tapering trunk from 2 to 3 feet in diameter. The orange-brown bark of mature trees is made up of many closely pressed papery scales and may be a half-inch thick. The light red to orange-yellow heartwood is exceedingly hard, strong and durable.

Availability and Use—The stand of longleaf pine is not definitely known, but it is estimated to be 19,000,000,000 board feet (chiefly in Florida, Alabama and Georgia). Two features make longleaf pine desirable over most other trees for construction work—its great strength and the large sizes in which it is available. It is used extensively for heavy girders in both buildings and bridges, for masts and spars, railway ties, general construction, flooring and interior finish. The commerical value of longleaf pine is by no means limited to its lumber. The value of the naval stores procured from this species is approximately $35,000,000. These naval stores include pitch, turpentine, tar and resin, which are made from the crude gum which exudes from pine trees when "chipped" or wounded. It also is applied to similar products obtained by distilling the pine wood. Paint and varnish, soap, shoe polish, paper and printing ink use up most of the naval stores. Chipping of the trees and distilling the gum employs several thousand people and is one of the major forest industries of some portions of the southeast.

Fire and hogs are the worst enemies of longleaf pine. During the early seedling stage light grass fires do comparatively little harm, but this apparent immunity becomes less effective as the trees get taller. The sweet succulent roots appeal to hogs that range the southern pine country. Various insects and fungus diseases attack longleaf pine, but the one most generally recognized is the pine beetle.

PACIFIC YEW

The Sacred Tree

Taxus brevifolia, NUTTALL

Habitat—The yews are world-renowned trees. The genus Taxus contains six species which are widely distributed through the Northern Hemisphere, being found in North America, Europe, northern Africa, western and southern Asia, China and Japan. The yew is closely associated with folklore and history. The Pacific yew occurs in the coast region from the southern tip of Alaska southward through British Columbia, Washington, Oregon and the northern portion of California; also in the Sierra Nevada mountains of eastern California; and farther inland from the Selkirk mountains of southeastern British Columbia to the western slopes of the Rockies in Montana and Idaho and to eastern Washington and Oregon.

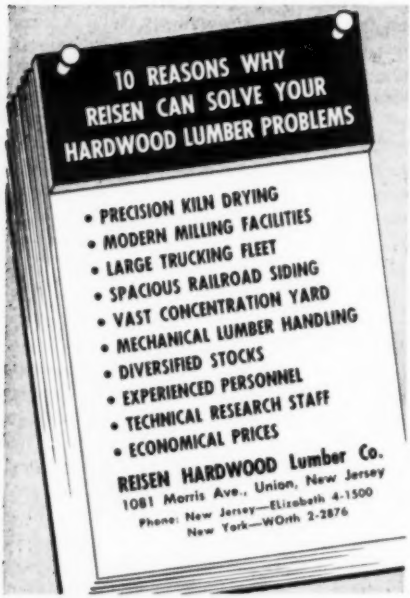
Growth and Appearance—The tree attains its largest size in the Pacific coast region. Its usual height is 20 to 40 feet and a diameter of 12 to 15 inches. The trunk is straight and conical, but conspicuously ridged and fluted by an apparent infolding of the surface. The crowns of old trees are usually rounded and often unsymmetrical. The tree has a purplish bark which is conspicuously thin, rarely more than a fourth of an inch thick, and is composed of thin, papery, easily detached scales, beneath which the newer unexposed bark is a clear rose or purple-red. The fine-grained wood is very heavy, hard and strong.

Availability and Use—The Pacific yew is of minor commercial value. It has long been believed that this tree has a deep religious significance and it has been considered a sacred tree, associated with churches and burial grounds. Its somber melancholy appearance is thought to be symbolic of sorrow, sadness and death. Occasionally it lives for 2000 years, and its evergreen character also is a sign of immortality and resurrection.

The wood of the yew is useful mainly for archery bows, canoe paddles and small cabinet work but is of little commercial importance because of its scarcity.

ROYAL PAULOWNIA

Named for a Russian Princess



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Paulownia tomentosa, (THUNBERG) STEUDEL

Habitat—Introduced into this country from China and Japan, it has escaped cultivation and occurs chiefly from southern New York and New Jersey southward to Florida and Texas, and occasionally in other localities where the winters are not too severe. It prefers deep, rich, moist soil and is most often seen in waste places in towns and villages.

Growth and Appearance—The genus Paulownia is named in honor of a Russian princess, Anna Paulowna, daughter of the Czar Paul I. Tomentosa refers to the hairy or tomentose leaves. The name "princess tree" is also applied to this species. The royal paulownia presents a strikingly handsome appearance in the spring with large pyramidal clusters of violet-colored flowers that fill the air with their fragrant perfume. The broad, long-stalked leaves give the tree some resemblance to catalpa. The leaves are broadly egg-shaped, short pointed, from 5 to 15 inches long, 4 to 8 inches wide. At maturity they are thick and dark green.

Availability and Use—The royal paulownia is commonly grown in the United States as an ornamental tree, but is not ordinarily grown north of the latitude of New York City because the flower buds are usually killed during the winter. It is often grown as an ornamental foliage plant farther north, however, by cutting it back to the ground at the end of the growing season. When this is done, a single shoot will sometimes grow to a height of 10 to 12 feet during the summer.

SCOTCH PINE

The Pioneer Tree

Pinus sylvestris, LINNAEUS

Habitat—Scotch pine has been more extensively planted for forestry purposes in eastern North America than any other

European tree. Plantations, windbreaks and ornamental plantings from western North Carolina to Quebec, and across the Lake states to Saskatchewan and northwestern Nebraska testify to this tree's indifference to soil and climate conditions.

Growth and Appearance—Scotch pine attains heights of 60 to 90 feet with diameters of 1 to 3 feet. Forest grown trees are tall with a straight unbranched trunk of relatively little taper. Trees grown in the open retain their branches well down toward the ground. The needles are one and a half to three and a half inches long. They are dull blue-green, appreciably flattened, rigid, sharp-pointed and usually twisted. This tree has had difficulty in getting started. Early plantings were largely from seed of low, stunted, high mountain trees, producing crooked trunks and poor quality wood. However, American grown trees of the variety from the vicinity of northeastern Europe, which have been planted since 1920, are expected to inherit their parents' tall, straight form.

Availability and Use—Throughout Europe, it is widely used for general construction—buildings, bridges, scaffolding, ships' masts, mine props, fencing, paving and the better grades are selected for joinery. The wood gives good results with paint or varnish, can be effectively stained and is easily glued. In this country, as a sturdy pioneer, Scotch pine has established itself in growing vigorously on long abandoned lands and adjusting itself to sandy soils as well as to moist, well drained soils, where it thrives. As you notice in this case, trees may not have their greatest worth in the lumber or other products they produce. The very fact that they are alive is their value to mankind.

SHORTLEAF PINE

Unusual Ability to Sprout from Stump

Pinus echinata, MILLER

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Habitat—This is one of the four important southern yellow pines. It is found in varying abundance from Long Island and southwestern Pennsylvania south and westerly to eastern Texas and Oklahoma. It prefers well-drained light sandy or gravelly clay soil. On moist soils along the coastal plain it is crowded out by loblolly pine and longleaf pine, with which it is often sold as lumber.

Growth and Appearance—The long clean trunk has little taper and is surmounted by a relatively short, pyramidal or rounded crown consisting of limbs arranged in more or less regular whorls. The oldest and stoutest of the limbs are rarely over 25 feet long and are somewhat drooping. Trees 80 to 100 feet high and 2 to 3 feet in diameter are not uncommon, but trees 120 feet tall and 4 feet in diameter have been recorded. It reaches maturity at about 120 years and occasionally lives over 300. The slender dark bluish-green leaves are three to five inches long, occur in clusters of two or three and remain on the tree for from two to five years. It is unusual among all pines because of its ability to sprout from the stump, or when injured by fire.

Availability and Use—Shortleaf pine, along with all other southern forest trees, suffers from the yearly burning of the woods. Next to the loss from fire is that from attacks of the southern pine beetle. Other enemies include insects and fungus diseases. The wood is used extensively for house building materials—framing, weather board, panels, window and door frames, casing and carved work. The grain shows well in natural finish or when stained. Frames of overstuffed furniture, chairs, desks, excelsior, wood pulp, mine props, barrels and crates are made of shortleaf pine.

SLASH PINE

One of the Most Commercially Profitable Trees

Pinus caribaea, MORELET

Habitat—Slash pine ranks high among the rapid growing, early maturing pines of the southern coastal plain. It grows on low ground and on hummocks in swamps or moist "slashes" from southern South Carolina to the keys of Florida and westward across Georgia, Alabama and Mississippi to eastern Louisiana.

Growth and Appearance—Best growth and purest stands are attained in Florida and southern Georgia, where trees rise to heights of 80 to 150 feet. The average height is about 100 feet. The dark lustrous green needles grow in bundles of two, three or more, but are most frequently in pairs. They are 8 to 12 inches long, forming dense clusters near the ends of the branches, and drop off in their second season.

Availability and Use—Slash pine is the best of the southern pines in production of quality rosin or gum containing large amounts of spirits of turpentine. Its wood is about the heaviest of all pines and comparable to the hickories and white oaks. Large quantities of second growth lumber are cut for railroad ties, increasing amounts for pulpwood, and mature trees are used for general construction and interior trim.

The moist location of most slash pine stands provides natural protection against fire, but trees are often subject to red heart rot. Slash pine is one of the most rapid growing and early maturing of all eastern forest trees. Because of its capacity to produce pulpwood, fuel, lumber and naval stores, it is being planted in several of the southern coastal states. Moreover, it is recognized for its unusual beauty and is being used to an increasing extent for landscape and roadside planting in the south.

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OPENING OF INDUSTRY-WIDE HARDWOODS EXHIBIT

The evening of March 19th will mark a milestone in the history of the growth and progress of the hardwoods industry. On this date the industry will inaugurate its first major cooperative consumer education program — the $350,000 permanent Hardwoods Exhibit nearing completion at Chicago's world-famous Museum of Science and Industry.

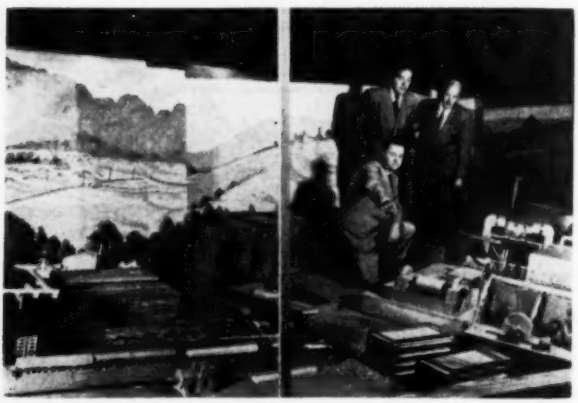
All segments of the many-faceted hardwoods industry are represented in this colorful exhibit which will tell the complete story of hardwoods — from living tree to finished products.

Over 200 different companies and associations have contributed money and materials to make this exhibit possible. It has been prepared under the supervision of a voluntary industry committee headed by Co-chairmen T. J. Connelly, of the Dean Company, and William C. Linn, of the Hoosier Veneer Company. Burdett Green, of the American Walnut Manufacturers' Association; Charles Close, of the Veneer Association; George Lamb, of the Mahogany Association; and William Hunt, of U.S. Plywood Corporation, complete the executive committee.

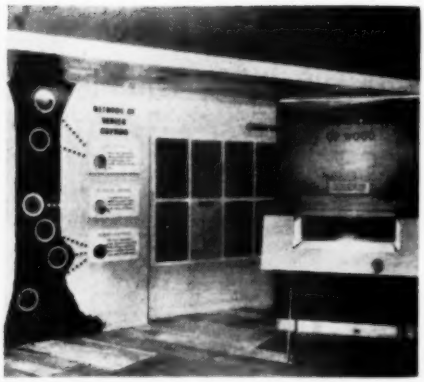
Leading members of the hardwoods industry from all over the United States and trustees of the Museum of Science and Industry will be guests at the dedication banquet and official opening of the Hardwoods Exhibit.

Henry Glass, industrial designer, inspects the finishing of the executive's desk he designed for the "Office of Tomorrow" display. This display is sponsored by the Wood Office Furniture Institute. Drop-leaf sides of the desk raise to form a 10-person conference table.

Among the displays in the exhibit that will tell the story of hardwoods in an interesting, easy-to-remember form are a "living tree" that (through a recording) tells of its own biology, an animated scale model sawmill, veneer mill and plywood plant, a "weigh yourself" scale that shows the strength of modern adhesives used in plywood,



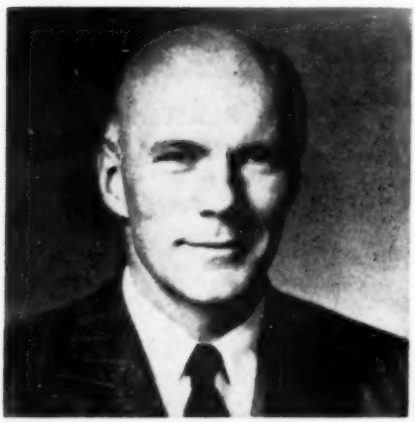
Checking progress on the permanent Hardwoods Exhibit are T. J. Connelly, president, the Dean Co., and co-chairman of the exhibit committee; and committee members William Hunt, George N. Lamb. They are planning the arrangement of scale model machinery for the exhibit's action display of a model sawmill, veneer mill and plywood plant.



Wood figures found in furniture are explained in this nearly completed section of the exhibit. The display includes a "tree" that will show the various figures found in different parts of a tree. Sixteen large wood panels will further illustrate wood figure types.

a visitor-operated mirrored veneer-matching machine, and a globe that lights up to show the sources of 48 different hardwoods.

In the "Hall of Hardwoods," where finished products will be shown, the life of Skeezix will be used to illustrate, in three-dimensional scenes, how hardwoods serve one from infancy through adulthood in many ways. Model rooms and other exhibits will also be used to show the public beautiful hardwood products that will give them a better way of living.



Charles R. Sligh, Jr., president of N.A.M., will be the keynote speaker at the dedication banquet to be held March 19.

AMERICAN FLOOR SURFACING COMPANY

The American Floor Surfacing Machine Company, Toledo 3, Ohio, is offering a special folder to celebrate its 50 years in the industry. The firm manufactures floor sanders and edgers, maintenance machines, industrial vacuums, portable electric tools and abrasive papers and seals. The folder includes pictures of all of their machines—old and new models. There are also information sheets describing floor sanders and maintenance machines. There is, too, a mimeographed report on the history of the company. In addition to the thousands of U. S. firms using this equipment, the American Floor Surfacing Machine Company also does an export business in Mexico, Cuba, Germany, England, etc.

MEMORY JOGGER

To have efficient, loyal, productive employees, you must show them the best ways to be efficient, loyal and productive. This cannot be done by merely giving orders. The supervisor is the best intermediary in dealing with your workers. He, in turn, is usually a man of pride in his work. He has a sense of responsibility which, even if dormant, can easily be aroused when the right method is used. The "Supervisor's Memory Jogger," available from the National Foremen's Institute, Inc., 100 Garfield Ave., New London, Conn., will be of great help. This shirt-pocket-size memorandum book of 48 pages—with plenty of space for the things a foreman wants to and should jot down from day to day—has a wealth of material which will help better employer-employee relations.

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Tumble Finishing of SMALL WOOD TURNINGS

MANY of the best techniques and most efficient finishing room equipment have had their origin in a shop where some ingenious paint room man has evolved an easier, quicker and better way of doing some particular job. In fact, the paint and machinery manufacturers are indebted to these interested and capable paint room men who, constantly applying their experience toward getting improved results, have developed, among other things, the tumbling method of applying finishes.

There are many ways and means in use for the tumbling application of paints and enamels; each one is quite individual and in many instances varies considerably, regulated by the product being finished. However, certain fundamental rules apply in general for this finishing method. Of course, the effort is to produce a finish equal or superior to that obtainable through the use of any other process.

As it has often been said, the most satisfactory and economical finishing of wood products starts when the wood is first put into work. Emphatically this axiom applies to small wood turnings—more so in fact than it does to any other wood product. In this article we presume that the material has been properly prepared for finishing. It is our belief that the tumbling method is principally most economical for finishing large quantities of small items in continuous production. Paint or other material goes further and does a better job more quickly when the tumbling method is properly applied.

In the tumbling method, as contrasted with the dipping method, the correct technique requires several very thin coats. Dipping requires two heavy coats after a first coat applied by the tumbling method. In the tumbling method, an enamel has a short quick setup, while when the dipping method is used the enamel has considerable flow.

Until the appropriateness of the tumbling method was proved to the equipment manufacturers, much of the machinery for tumbling small wood turnings and similar items consisted of an

empty shellac or molasses barrel mounted waist high with a shaft running directly through the center of the heads. It is considered good practice to have the barrel mounted at an angle in order to obtain a weaving effect as the barrel turns. An access door, 8 or 10 inches wide and 12 or more inches long, is located in the side of the barrel. This door must be fitted in such a manner that it can be securely fastened in closed position while the barrel or drum is rotating and easily opened for filling, emptying and cleaning. The shaft running through the barrel or drum should be fitted with a large drive pulley and connected by a belt direct from the shaft when shaft driven. The gear should be set down to about 25 to 30 revolutions per minute.

I want to call attention to the fact that, although there may be exceptional applications where special shop designed tumbling equipment may be needed, there is now available, from tumbler, barrel and drum manufacturers, complete tumbling equipment. Some of these companies supply barrels with drive shaft and pulley, the barrel made of wood or metal. There is also a variety of shapes in these barrels. Some are cylindrical, with round ends, others are hexagonal or octagonal. There are still others designed to operate in an up-tilted position. These are open at the top end with no drive shaft inside the container. This type has a holder at the base designed to agitate the container so that it revolves.

For the best results, the tumbling barrel should be not more than one-half to five-eighths filled with small turnings for the application of each coat of finishing material. However, patience should be exercised to see that the liquid coating prepared for the particular items to be tumbled is poured in carefully and sparingly, distributing it over the leveled contents of the barrel from end to end.

Through this tumbling process, distribution of the liquid is continued indefinitely as the barrel is rotated and the small wood turnings, wet with paint, continue touching others, wetting them with paint until they are all completely covered. The rapidity with which the barrel or drum turns is important. If it rotates too slowly the liquid does not flow properly and too much speed will make the wood turnings skip contact causing incomplete coverage. As we noted before, a speed of between 25 to 30 r.p.m. gives best results.

Excellent results have been obtained through the use of a large, open-end, cornucopia-shaped tipping tumbler or the open-end rum or "ash-can," either one mounted at a slant on a revolving shaft. These containers permit special work to be done through the application of the enamel or other material with a low pressure spray gun as the parts go by, giving an immediate start to a thin uniform distribution. This method will prevent a "pile-up" of paint or enamel on flat-faced turnings which might cause sticking later on.

Economy is one of the attractive features of the tumbling method, not only insofar as time consumed, but in the amount of enamel, varnish, stain or filler used. After the material has been mixed in the proper proportions with thinner, a carefully measured amount can be placed in the barrel from a convenient vessel. Too much liquid placed in the tumbler will produce a gummy mess, waste material and create bad sticking when the turnings are being dried. It will also increase the visibility of craters or contact marks and where there are thick coats, will look muddy or dull.

Drying after tumbling is simplified by having the tumbler mounted waist high, which makes it easy to dump the contents in the drying trays underneath. For convenience, and in view of

the tumbler door size previously mentioned, a convenient size for trays is about 2 feet wide by 3 feet long with wood or metal sides 4 to 6 inches high. The bottom of the tray should be made of wire, ¼" or ⅜" mesh; this permits air to pass up through the coated turnings, even though the trays are two-thirds full. It is advisable to shake the trays once at least while the contents are drying to prevent any tendency to stick. This must be done carefully in order not to increase contact marks. If the paint or enamel has been applied sparingly, these contact marks—where one piece lies against the other while drying—will not be readily apparent to the eye. Under such conditions trays should remain undisturbed until the coated contents are dry.

In order to control drying troubles, hold down the amount of enamel used, or while the wet run is still on in the tumbler add a little extra thinner, particularly if it appears that too much enamel has been used. If too much enamel has been used and it has dried on the turnings, pumice or grind off some of the finish and recoat. On the other hand, if too little enamel has been used let it go through to completion and put on an extra coat later.

Part of the preparation of small wood parts for tumble finishing can be done in a tumbler. Pumicing is a case in point. Here the barrel or drum used should have a screen or wire mesh trap door. Because of the dust it creates this tumbling should not be done in the same room where the enamel, paint or lacquer is applied.

The method suggested is to fill a clean, mounted barrel about two-thirds full with raw turnings then add six to eight Grade A, egg-size lumps of pumice or, should pumice not be available, tear several sheets of coarse sandpaper and place them in the barrel. There are two advantages to this tumbling action with pumice or sandpaper in the barrel; it will smooth the turnings and also fill the wood a little. A word of warning: be careful to avoid running the barrel more than half an hour without checking. Too much tumbling may grind off the detail on sharply cut turnings.

Preparation such as this smoothing-the-surface will go a long way toward producing a better finishing job, as enamel or paint unfortunately does not always cover all the blemishes. In fact, it has more of a tendency to emphasize many inequalities. Smoothness is a must for any article to be enameled or otherwise finished. Another way to obtain the desired smoothness is to give the turnings a long run in the tumbler with the first filler coat, until the coat is completely dry. This will smooth out the parts quite effectively.

Wood articles generally require three coats in tumble finishing. Exceptions are white and yellow, which usually require four. A non-toxic specification in yellow paint makes it particularly good for children's toys. If this color is used, more than four coats may be needed.

The need to get into the grooves or recesses in the turnings can be accomplished by flooding the first coat, either with filler or filler plus enamel. That is, enamel added to color the filler or with the enamel itself plus a suitable amount of thinner. There is little danger of sticking on the first coat just described, as practically all of the material will sink into the wood giving a color coating to those parts of the turnings which the next sparingly applied coats of paint or enamel might not even reach.

Care and cleanliness are imperative for finishing success by any method, even more so by the tumbling system. Before placing your smooth turnings into the tumbling barrel, see that they are free of all sawdust, pumice dust

and dirt. The usual tumbling barrel has a capacity of 55 gallons. Fill such a barrel about one-half to five-eighths full and pour in a mixture of about one quart of enamel and one-half pint of thinner, VNP naphtha, white gasoline, mineral spirits or turpentine. Fasten the door and run for 10 minutes. A longer run is needed and flooding with a little more thinner is required to carry enamel into the turnings containing grooves, instead of being completely round like balls.

There are times when deeply recessed turnings will require the addition of several handfuls of small chips or beads to act as "carriers" to convey the enamel into all parts. These "carriers" can be sifted out later and reused. On the first coat no particular harm can result from a little too much enamel; and if an insufficient amount is used, the run may be stopped and the required enamel added. This first coat is the only one where enamel may be added. On all the other coats, should insufficient material be used, the run should be completed using the starting mixture and a coat added later.

There is a difference of opinion among tumbling enamel operators about using filler for the first coat. Filler is cheaper than enamel and it does thoroughly fill and seal wood and all porous surfaces and it gives a good foundation for following coats of any paint product. You can add enough enamel to start filler toward the color you are going to use; although filler is a neutral shade ordinarily. Other operators prefer to use the enamel direct on the first coat, in that way they get all the color at once.

When filler is used the same thinning should be added to the same quantity as was mentioned for the first coat of enamel. Enough enamel should be

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added to tint it if desired. In case a clear finish, such as a varnish stain, is to follow, or if a penetrating oil stain has been used to color the wood at first, then use a clear filler, not a pigmented one.

Before I proceed further, and in view of its importance, I had best give some attention to drying such tumbled enameled turnings. They can be either baked or air-dried. The former method is generally preferred although splendid results are obtained through proper air-drying. The advantages of baking or force-drying are definite. For example, by this means it is possible to apply two coats a day while air-drying requires two days. Baked articles have greater final hardness and brilliance although air-drying finishes when finally bone-hard compare favorably with baked finishes.

If desired, air-drying enamels may be baked or their drying accelerated with forced heat such as that provided by the fan-type which gives about 100° F. Some enamels, such as those containing wax, can only be dried by baking temperatures which may range from a low of 130° F. to 150° F. up to 225° F. This is short of the point where the enamel might blister or the wood scorch.

The ability of the paint room man and his judgment are important as he is constantly called on to decide when conditions are "just right" for this or that action. A good illustration is in the case of baking wax-content enamels which dry by baking only. These enamels are excellent for flat-faced turnings where sticking is expected because they dry face-to-face with no opportunity to give them any snap or crack to break them apart. The paint room man must see to it that not too heavy a coat of wax-contained enamel is used.

For especially troublesome jobs non-stick material can be obtained sepa-

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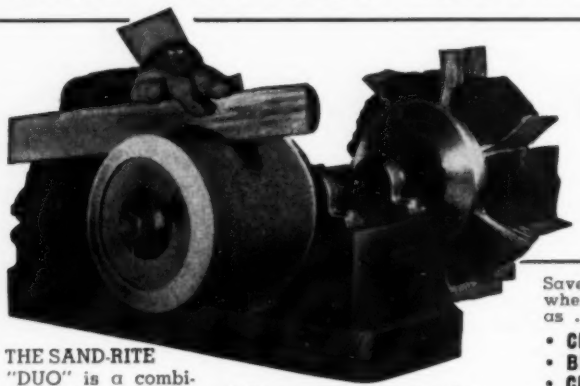

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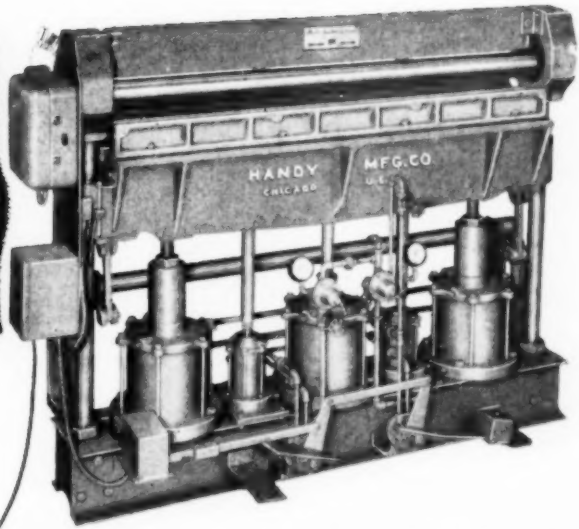

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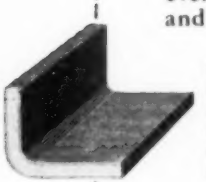

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rately and can be added one-half pint to a gallon of enamel. Where no painting or hand decorating is to follow, a wax-contained tumbling enamel is quite desirable. It also gives a waxy smoothness and freedom from sticking. Regular enamels as well as synthetic types that finish extra hard, brilliant and fast drying are available, wax-contained for those who want to bake or dry with forced heat.

Special attention is required for the finishes used on toys for children, regardless of method of finishing. Manufacturing operations are definitely protected as to quality of finish by specifying that the tumbling, dipping, spraying or brushing paints or enamels shall be toxic- or lead-free and non-poisonous. No appreciable content of injurious materials is permitted in the paint formula for any toy parts or completed toys that might reach a child's mouth. Paint manufacturers are fully conversant with the laws on this subject and the company doing the painting can be guided by their recommendations when choosing paints and enamels for this use.

Tumbling the second coat should not take place too soon after the first coat has been applied. The trays full of turnings that have been removed from the tumbler are submitted to overnight air-drying. To hasten the procedure they can be given a much shorter forced heat drying or a two hour baking at about 150° F. to 180° F. When dried as described above, they can be dumped back into the barrel until it is five-eighths full. When enamel is used, mix one and one-fourth pints of it with one-fourth pint of thinner and splash this into the barrel over the turnings, being careful to get good all-over coverage. For this quantity of turnings the amount of enamel recommended may seem small: it isn't, however; and six minutes

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of running should show a wet coat covering all articles in the barrel and that is enough for the second coat.

When all the turnings have been covered there is no point in further tumbling. In fact, too much turning may grind off detail and perhaps some of the finish you are putting on. The coated turnings should then be returned to the drying tray, using any of the above-mentioned methods of drying. There are occasions when insufficient enamel has been used, which means recoating the item. If the right amount of material has been used after this application, the gloss will begin to show. Often these two coats are enough. Here again the skill and know-how of your paint room man will prove its worth.

Under most conditions the third coat is all that is needed. For this coat a short pint of enamel without thinning, or two-thirds of a pint of enamel with a small amount of clear tumbling varnish, will produce the color and gloss you wish. It should take about five minutes to do the job, covering everything. After this the turnings should be removed from the tumbler and placed on the drying trays. Now your turnings should show no trace of wood grain or any of the original coating material, only the gloss enamel color, smooth and firm. Remember to use this third coat sparingly to prevent any possibility of contact marks developing. When this third coat is dry, the wood product will not have surface inequalities. It will have a metallic hardness and have a clear clicking sound when the pieces are struck together.

There is no way, however, that enamel or paint coatings, regardless of the number of coats, will make up for rough work or poor turnings and bad quality wood or other serious blemishes. In the beginning you must have good turnings. The lighter colors may need one

or more coats of clear gloss varnish for polish. A final coat may also be specified for semigloss, rubberoid, etc. This should be handled in the same manner as this coating just described.

The quantity of tumbling enamel needed to coat a specified number of small wood turnings varies but is proved to be less than the amount used in any other method of application.

Round ¾" balls—5 gallons of enamel for 100,000
Round ⅞" balls—5 gallons of enamel for 75,000
Round 1" balls—5 gallons of enamel for 60,000
Handles ¾" x ¾" x 3"—5 gallons of enamel for 40,000

In any of the above, an additive of one gallon of thinner should be included. These quantities apply where coats are used and start with the raw wood. The turnings that have been presmoothed by being tumbled with pumice take even less than the quantities mentioned here.

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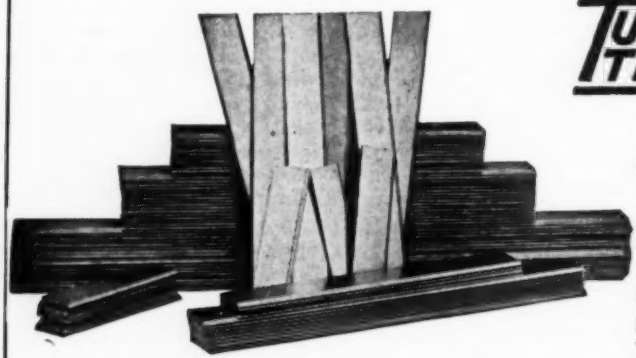
WAPAKONETA PRESIDENT DIES

Carl D. Fischer, Jr., president and general manager of the Wapakoneta Machine Company, Wapakoneta, Ohio, died December 28 at his home. He was well known as a philanthropist, civic leader and church worker.



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Appointments

W. A. King has been named regional sales manager of the American Cyanamid Company's plastic department in the midwest territory.

Snyder Chemical Corporation has announced the appointment of **Alan F. Shepardson** as synthetic resins and plastics consultant to their technical staff.

The National Wooden Box Association elected **R. F. Miles,** president of Rathborne, Hair and Ridgway Box Company, Chicago, at their January meeting.

Charles E. Devlin is the new executive vice-president and general manager of Northwest Door and Plywood Sales, Inc. of Tacoma, Washington. Formerly he was with the Simpson Logging Company of Seattle.

The board of directors of the Southern Plywood Manufacturers Association has appointed **John L. Butler,** chief of the Southern Plywood Manufacturers Association Inspection and Testing Department, to serve as acting manager of the association. **C. W. "Bill" Dietterich,** who had been managing director for the last five years, announced his resignation recently. He has accepted the position of sales manager with the Darlington Veneer Company, Darlington, S. C.

D. S. DeWitt, Oconto, Wisconsin, was re-elected president for the second year at the 56th annual meeting of the Maple Flooring Manufacturers Association held in Chicago the end of January.

Appointment of **John H. Phelan** as the midwest sales engineer representing their complete line of industrial dust and vapor control equipment is announced by the Aget-Detroit Company of Ann Arbor, Michigan.

J. H. Eigenberger, district manager for DeWalt Inc., has been assigned a new territory in the southwestern part of the country. His new territory is comprised of southern Texas, southern Mississippi and the entire state of Louisiana.

DeWalt Inc., manufacturer of power cutting tools for wood, has elected **Samuel Sloan Auchincloss** as president. Formerly he was executive vice-president.

Samuel S. Auchincloss

Arthur H. Mohring

Arthur H. Mohring was elected president of Ponderosa Pine Woodwork at the association's annual meeting which was held in February. Vice-president is **F. A. Hoerner;** secretary, **J. D. Rowland** and treasurer, **Paul Curtis.**

The American Forestry Association has appointed **Lowell Besley** as executive director-forester.

The National Lumber Manufacturers Association has added **Gerald F. Prange** to its technical department staff.

John J. Summers, an experienced lumberman and lumber grader, has been named field representative in New England by the Western Pine Association.

Midwest manager for American Forest Products Industries is **Nort Baser,** a former Michigan newspaperman. Mr. Baser will be in the Chicago office.

ABRASIVE FOLDER

The Mid-West Abrasive Company of Owosso, Michigan, announces a new folder on resin seal garnet. This is a new type of coated abrasive for the woodworking industry.

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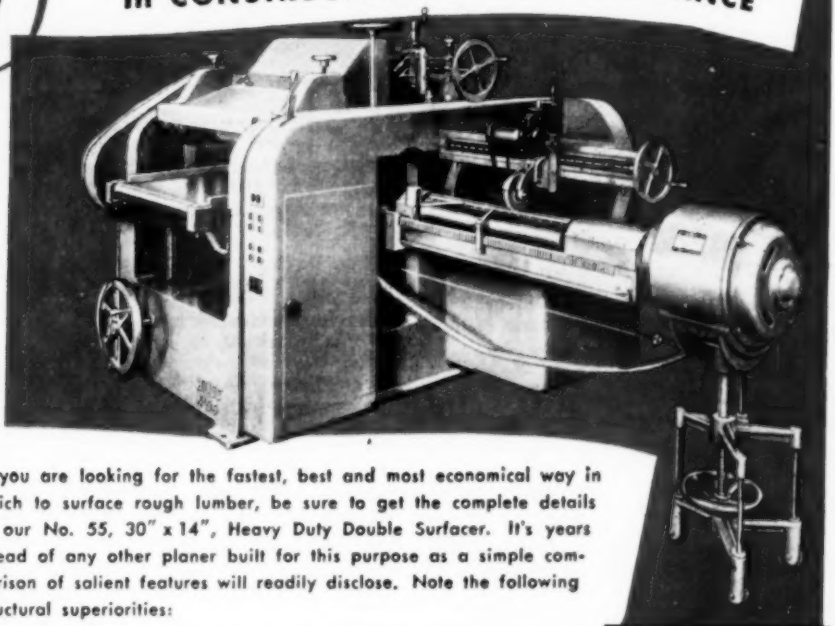

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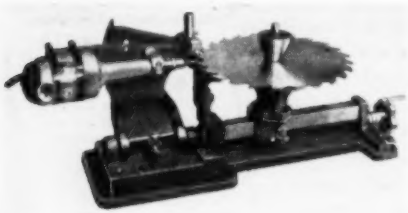
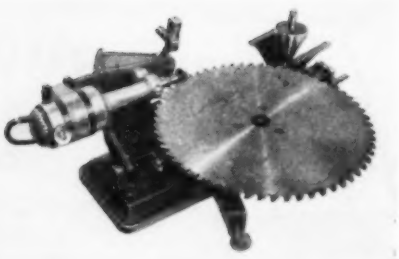
This carbide tip saw grinder is primarily designed for the purpose of grinding top clearance on carbide tip circular saws. The maximum feed per cut with the diamond wheel should not exceed .0005 per cut, with a steady slow



pass over the top of the teeth. The manufacturer is Hunter Brothers Saw Manufacturing Company, 1290 University Ave., Rochester, N. Y.

The machine is also designed to grind the face or front of carbide tipped saws. The necessity for grinding the face of the teeth can be eliminated by grinding



the top clearance more frequently. Although primarily designed to sharpen the tops of the teeth—both straight and alternate bevel types—a special attachment enables the user to grind the face of the teeth.

WORK BENCHES

Made of selected kiln dried Douglas fir, this work bench is assembled with bolts. It is 24" wide, 30" high and 60" long. Manufacturer is the Martin Baumann Company, 370 Lexington Ave., New York 17, N.Y. The work bench is of slotted construction so that it is possible to fasten pieces of work in any position for planing, sanding, routing, gluing, etc. Through nailing or drilling can also be done over the slots. The saw will pass through the slots if the job requires it.

The bench is also convertible into a plain surface bench by a removable top that comes with it. There is a 6" opening on the left-hand side of the bench apron to hold a carpenter's metal vice. Power tools as well as machinist vise can be attached easily by bolting them to a wooden base mounted on one or two 2 x 4's. Holddowns then lock the base to the bench. Full details are available from the manufacturer.

For current literature on woodworking equipment, refer to our "Help Yourself" page.

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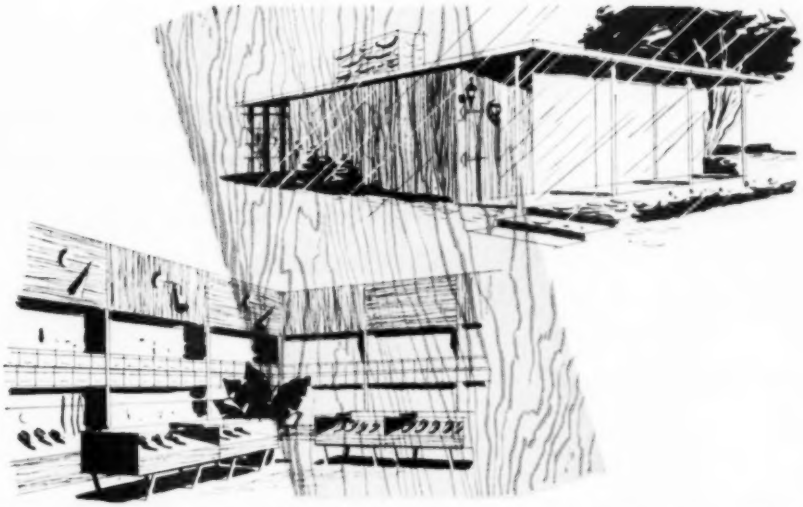

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3. NONSTAINING. MELURAC 300 is clear and colorless . . . quick setting . . . nonstaining. You can use thinner veneers and lighter woods.

4. LONG WORKING LIFE. When properly prepared, MELURAC 300 has a usable life of more than 10 hours at 90° F. Glue loss is cut to a minimum.

5. LONG ASSEMBLY TIME. Under normal conditions, veneers spread with MELURAC 300 can be stored several days, if necessary, before pressing. Avoids need for precure.

6. MODERATE CURING TEMPERATURE. Optimum pressing temperature is only 240° F. . . . minimizes "blows."

7. FAST CURE. With Cyanamid's Hardener M-325, the cure rate of MELURAC 300 is virtually as fast as Urea resin adhesives.

MELURAC 300 provides a completely waterproof, boil-resistant glue line for high quality plywoods—flat or curved, light or heavy, for interior or exterior applications. This resin combines the advantages of both melamine and urea . . . enables you to streamline production and realize important savings.

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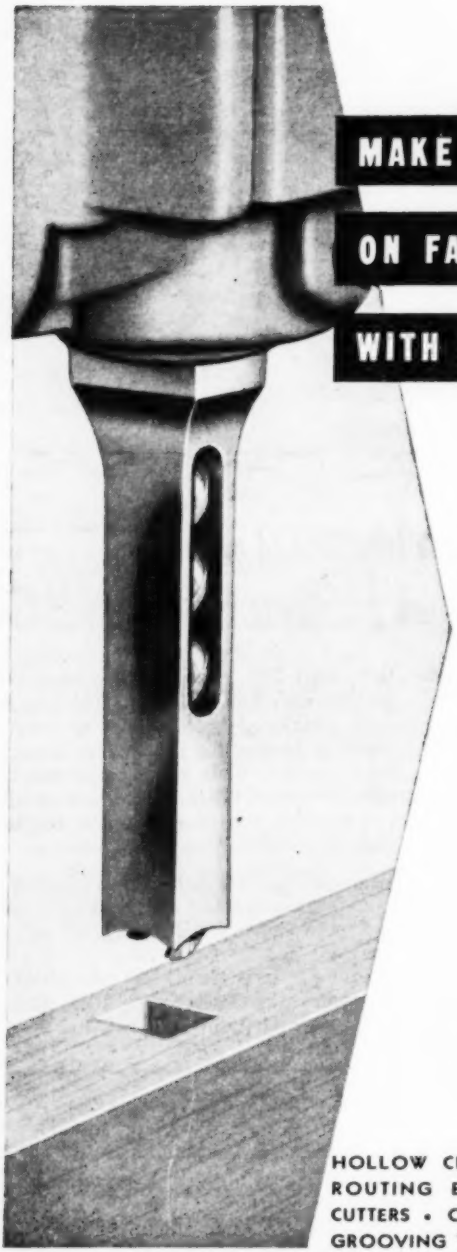

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RENEGOTIATION FACTS For Woodworking Plants

By Robley D. Stevens

Defense contracts are now big business. But do you understand the facts of renegotiation, what it is, and how it works for claiming profits?

WOODWORKING plants undoubtedly have a great interest in the renegotiation of contracts because the way management handles the procedures will certainly influence profits.

This much is certain: competition and other economic balances serve to keep prices and costs down and standards of production up. However, during a national emergency the government must use safeguards against excessive profits. Consequently, in upholding this safeguard, the congress has adopted as a national policy the principle that sound execution of the national defense program requires the elimination of excessive profits from woodworking plant contracts and subcontracts. In fact, this policy is clearly expressed in the Renegotiation Act of 1951, which, incidentally, was passed without an opposing vote in either house of congress.

In your search for renegotiation facts, it should be understood that renegotiation is not a taxing device and, unlike taxation, its primary purpose is not the production of revenue. It is, rather, a measure to induce closer pricing and prevent the retention of excessive profits. Hence, a woodworking plant that goes through renegotiation has documentary proof with which to refute arbitrary charges. In addition, renegotiation is not intended to deprive a woodworking contractor of the right to make and retain a fair and reasonable profit. It fully recognizes that the profit motive of the free enterprise system must be retained as an incentive to production.

Now, what's behind it all? Well, all woodworking plant contractors and related subcontractors having renegotiable contracts with the following agencies are required to file with the Renegotiation Board at the end of their fiscal year a report of total income received or accrued from all of their defense contracts. Such agencies whose contracts are subject to renegotiation include: departments of defense, army, navy, air force, and commerce; General Service Administration; Atomic Energy Commission; Reconstruction Finance Corporation; Canal Zone government; Panama Canal company; Housing and Home Finance agency; Federal Civil Defense Administration; National Advisory Committee for Aeronautics; Tennessee Valley Authority; United States coast guard; Defense Materials Procurement agency; bureau of mines; geological survey; Bonneville Power Administration; and reclamation bureau.

The story of defense contract renegotiation will be written many times over as a number of woodworking plants undergo the process. In the light of this observation, management should understand some of the basic provisions cited in the act.

Section 103 of the act provides for a definition. "The term 'excessive profits'

means the portion of the profits derived from contracts with the departments and subcontracts which is determined in accordance with this title to be excessive."

In addition, in determining excessive profits favorable recognition must be given to the efficiency of the woodworking contractor or subcontractor, with particular regard to attainment of quantity and quality production, reduction of costs, economy in the use of materials, facilities and manpower; and in addition, there shall be taken into consideration the following factors:

(a) Reasonableness of costs and profits, with particular regard to volume of production, normal earnings, and comparison of war and peacetime products.

(b) The net worth, with particular regard to the amount and source of public and private capital employed.

(c) Extent of risk assumed, including the risk incident to reasonable pricing policies.

(d) Nature and extent of contributions to the defense effort, including inventive and developmental contributions and cooperation with the government and other contractors in supplying technical assistance.

(e) Character of business, including source and nature of materials, complexity of manufacturing technique, character and extent of subcontracting and rate of turnover.

(f) Such other factors, the consideration of which the public interest and fair and equitable dealings may require; which factors shall be published in the board's regulations from time to time as adopted.

Of interest to woodworking firms is the subject of renegotiation proceedings. Well, renegotiation proceedings are begun by mailing a notice to that effect, in such a form as prescribed by the regulations, via registered mail to the contractor or subcontractor. The board is interested in making an agreement with the contractor or subcontractor with respect to the elimination of excessive profits received or accrued.

In the light of these factors, every woodworking firm contractor or subcontractor who holds defense contracts must file with the board—on or before the first day of the calendar month following the close of his fiscal year—a financial statement setting forth such information required by the regulations.

This report is made on the Standard Form of Contractor's Report, which consists of two parts—RBForm 1 and RBForm 1B. The first part of this form, which calls for preliminary information, is to be filed within three months of the end of the contractor's fiscal year, and the more detailed second part of the form is due within 60 days of the due date of the first form.

The report is to be filed by every w o o d w o r k i n g contractor or subcontractor holding renegotiable contracts or having income from renegotiable contracts regardless of the amount received. In addition, the contractor reports on the aggregate amount received or accrued from all renegotiable contracts during the fiscal year covered regardless of whether he has one or a dozen. He will then be renegotiated on the total amount received. This means, in effect, that a high profit contract can be balanced against a low profit one when the determination as to excessive profits is made by the board.

Now just what is the m i n i m u m amount? Well, if a woodworking firm contractor or subcontractor receives less than $250,000 from all of his renegotiable contracts, or $25,000 in the case of a broker, agent, or dealer, he will not be renegotiated, although he is required to file a report.

Woodworking contractors' reports on renegotiable sales are sent directly to the Renegotiation Board in Washington, D.C. There they are screened to eliminate those which show income below the floors of $250,000 for contractors and subcontractors, and $25,000 for brokers, agents, and dealers, and those which clearly show no excessive profits. After this screening, the report is assigned to the appropriate regional board located in Washington, D.C.; Chicago, Ill.; Los Angeles, Calif.; New York, N.Y.; Boston, Mass.; or Detroit, Mich.

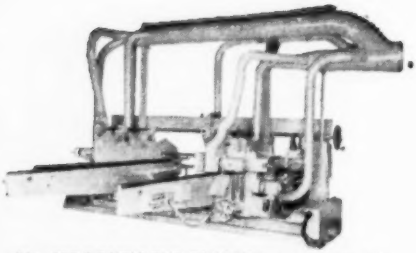
Now what about other factors? Well, woodworking firms should understand that not all defense contracts are renegotiable. Some have been exempted by the Renegotiation Act and some have been exempted by the board. These fall into two classes: mandatory, which the act requires the board to exempt, and permissive, which the board may exempt at its discretion. As pointed out in Section 106 of the act, management can gather the facts along this line.

There is no doubt that contractors and subcontractors concerned with the renegotiation of defense contracts will go into consultation with their attorneys and accountants in order to make an intelligent interpretation of the act. This will be necessary for the compilation of accounting reports, data, segregating sales, allocating costs, and developing a pricing policy. In this connection it is worthwhile to point out that perhaps the subcontractor's greatest problem may be that of deciding which of his contracts are renegotiable and which are not. However, for the prime contractor with a direct contract with one of the government defense agencies there is no problem in this respect. Yet, subcontractors who may be furnishing materials to a large number of customers having both renegotiable and nonrenegotiable business may have more trouble.

Woodworking firms should realize that the Renegotiation Board has put out in its regulations a number of guides and signposts. Copies of them are available from the government printing office at a small cost. However, it should be pointed out that any contractor or subcontractor who follows these in good faith need not worry about incurring any fines and penalties if he is ultimately found to have reported incorrectly. Contractors who can prove that they are entitled to favorable consideration under all such factors definitely should do so, for this may mean that more profits can be retained. If contractors do not agree with the Renegotiation Board's decision, they may ask for a review in the Washington headquarters, and if this is not satisfactory they may appeal to the Tax Court of the United States.

Penalties for noncompliance could be very heavy. That is, any woodworking contractor or subcontractor who fails or refuses to furnish any statement, information, records, or data required for renegotiation purposes could be fined $10,000, imprisoned for one year, or both. It should not be overlooked that the Renegotiation Board has the right to audit the books and records of any woodworking firm subject to the act. In addition, the Bureau of Internal Revenue may be made available for the purpose of making examinations and audits for renegotiation purposes.

In conclusion, the amount of profit which a woodworking firm may be allowed to retain depends on the ability of the management to measure its contributions to the defense effort, plus the assembly of all the facts and data required for renegotiation reports. To help stay with the professed objective, the task will be lightened if a woodworking firm will understand the rules, gather the facts and adopt a practical method for renegotiation purposes.



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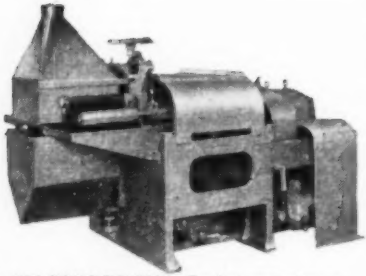
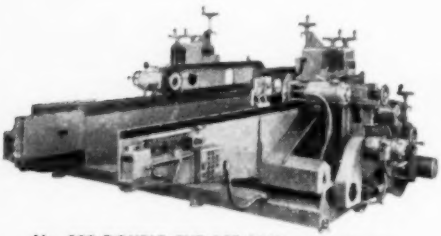
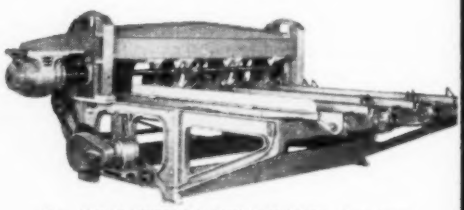


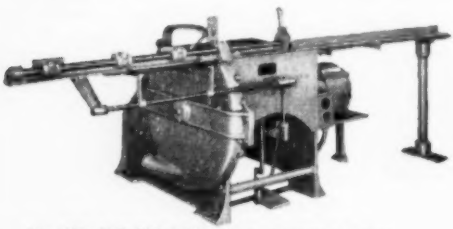
No. 441 GANG RIP SAW—For fast production on the most difficult gang ripping jobs. Six power driven feed rolls...12", 19" or 24" saw space...up to 125 HP . . . variable feed drive up to 300 ft. per minute . . . glue joint accuracy. *Ask for Bulletin No. 441.*



No. 300 DOUBLE CUT-OFF SAW—Accurate production at high rates of feed. Labor saving attachments such as cope motors, dado arbors and other devices are available for specific needs. *Ask for Bulletin No. 300.*

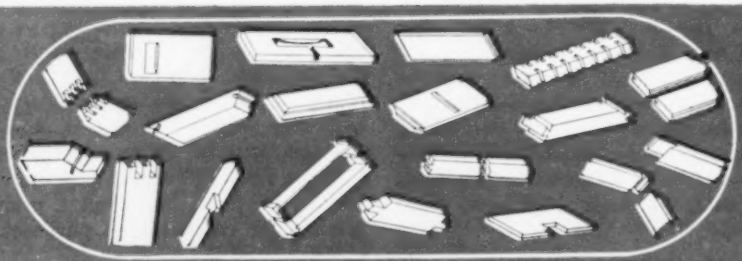


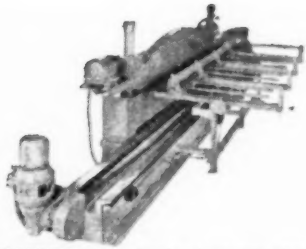
No. 435-H MULTIPLE CUT-OFF SAW—Cuts long boards into short pieces . . . will square cut large size sheets . . . and will cut any number of grooves. It's an excellent plywood sizer. *Ask for Bulletin No. 435-H.*



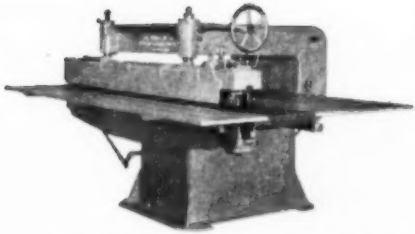
No. 477 CUT-OFF SAW—Capacity equals two or three swing, straight line or roller carriage cut-off saws—depending on the type and condition of the stock. Excellent for box work. *Ask for Bulletin No. 477*

No. 442-MT COMBINATION SAW—Versatile machine for ripping, cross cutting, grooving, dadoing, beveling, mitering. Cuts up to 48" wide and rips up to 50" wide. Easily handles large stock. *Ask for Bulletin No. 442-MT*





VENEER JOINTER—Traveling head principle eliminates shifting. No chain feed—no "stock wobble". Perfectly joints bundles of veneer up to four inches thick. Sizes from 90" to 212". *Ask for the Jointer Bulletin.*



VENEER SPLICER—Makes precision tapeless joints. Adjusts itself automatically for varying thickness of veneer normally encountered. Welded steel frame with 49" throat clearance at right. *Ask for Bulletin No. 50.*

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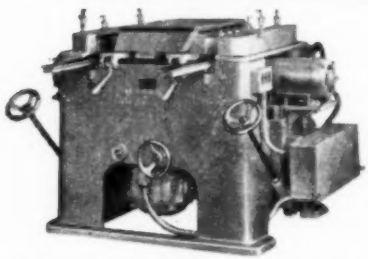
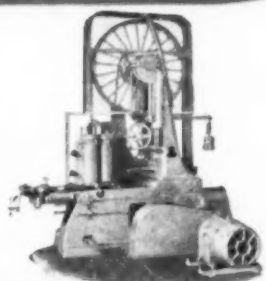


No. 326 MATCHER-JOINTER—For sash and door, furniture and box factories—as well as many special uses. Adaptable for jointing hogshead staves. Unequalled for "T" and "G" work. *Ask for Bulletin No. 326.*



VERTICAL BAND RESAW—Eight feed rolls eliminate "stock wobble". Sizes 48" to 60". Variable feed drive; 100% ball and roller bearings. 54" Twin Band Resaw. Combination band rip and resaw. *Ask for Resaw Bulletin.*

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DUST CONTROL DATA

To assist woodworking men in preparing information necessary to the analyzation of a dust control problem, the Day Co., 809 Third Ave., N. E., Minneapolis, has prepared a dust problem analysis sheet on which all pertinent information can be entered. This sheet is available in connection with a new Day folder concerned with the firm's "AC" dust filters.

Well-illustrated, the material deals with all aspects of dust control as achieved by this Hersey-type dust filter. It presents a practical approach to dust control problems and stresses the advantages of the filters, which have a continuous-automatic method of cleaning the filter cloth with high-pressure reverse jet air. By this method, filter shutdowns for cleaning or rapping are eliminated, it is pointed out. Charts and diagrams give further facts on the equipment, which has an efficiency as high as 99.998%, Day states.

CHRISTOPHER DRY KILN

The Christopher Unitemp Heating System Inc., P. O. Box 1062, Prescott, Arkansas, is offering a brochure, "Some Facts About America's Most Economical Lumber Drying System." The brochure attempts to explain the process of drying lumber by use of a direct-heated system which burns natural gas, fuel oil or propane. The booklet is well illustrated and clearly explains the Christopher circulation system.

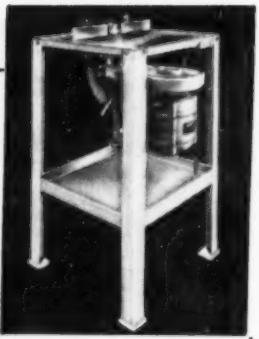
WEDGE MACHINE

A circular describing their wedge machine has been issued by the Frick Company, Dept. WD, Waynesboro, Pennsylvania. This machine is capable of producing up to 1500 wedges per hour. The machine was designed primarily to cut wedges for mines. The circular shows all parts of the machine and gives complete specifications. Wedges can be from 12" to 18" long and 4" to 7" wide. Thickness at the butt ranges between ¼" and 3": the point comes to a feather edge. Complete information can be secured from the company.

STARVED JOINTS

The Black Brothers Company, Inc., Dept. WD, Mendota, Ill., have issued a recent bulletin containing information about the care of resilient gluing rolls. It is called "Are You Annoyed with Starved Joints or Have Blisters Got You Seeing Red?"

Resilient gluing rolls that are improperly grooved, rolls that are worn down, that have an uneven gouged out surface, rolls that are off center because of worn shaft or journal bearings can mean the difference between a profit or a loss in the overall picture that reflects production costs. This informational sheet provides a description of the work required to repair the rollers and offers other helpful suggestions.



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PLYWOOD DIAPHRAGMS

The Douglas Fir Plywood Association, Tacoma 2, Washington, has a six-page folder called "How to Design Plywood Diaphragms." Subject matter tells how to design plywood panels for buildings. The material is well illustrated and tables and diagrams make it easily understandable. Plywood is said to have more than 1000 uses. It is the modern miracle in wood. This leaflet details instructions for using plywood as a building material.

GRAVITY FEED OILERS

The Oil-Rite Corporation of 2366 Waldo Blvd., Manitowoc, Wisconsin, has issued Bulletin 61-11. This bulletin supplements the recently improved line of small capacity gravity feed oilers found in their Bulletin 61-1. A description of the oilers is given and a table of sizes and specifications. This firm is equipped to furnish helpful information about lubrication problems.

WOOD SYMPOSIUM PAPERS

The transition of wood furniture production, from the slow and tedious hand-made process to modern assembly line methods, is described by Nelson C. Brown, wood utilization authority of Syracuse, N. Y., in the book, "Proceedings of Wood Symposium on One Hundred Years of Engineering Progress With Wood," published by Timber Engineering Company, affiliate of National Lumber Manufacturers Association, Dept. WD, 1319 Eighteenth St., N. W., Washington 6, D. C.

The book is a compilation of outstanding papers presented at the wood symposium held during the Centennial of Engineering Convocation in Chicago last fall. Symposium sponsors were American Railway Engineering association, American Society for Testing Materials, Structural Division of American Society of Civil Engineers and the Wood Industries Division of American Society of Mechanical Engineers.

Factors contributing to a century of progress in wood utilization are cited in these papers by recognized authorities on wood as a product and engineering material.

Another feature is the 100-year history of the development of woodworking machinery described by Judson Mansfield, chief engineer of Greenlee Bros. Company, Rockford, Ill.

F. P. R. S. PROCEEDINGS

The Forest Products Research Society has released its 1952 Annual Proceedings. The 344-page publication is titled "The Annual Proceedings of the Journal of the F.P.R.S. Vol. 2, No. 5."

It features the complete text of 48 papers presented at the nine technical sessions of the F.P.R.S. sixth annual meeting held at Milwaukee, Wis., June 23-25, 1952, and the full discussion from the floor which followed. It also describes in words and pictures the highlights of the meeting and includes official Society business.

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HOT PRESS BOOKLET

A handsome new 16-page booklet, just off the press, contains complete descriptions of Plycor hydraulic hot plate presses and explains in detail their construction and operation. The booklet is profusely illustrated and includes much interesting and valuable information. A copy may be had without charge by writing Plycor Company, Division of Earle Hart Woodworking Machine Company, 565 West Washington Blvd., Chicago, Illinois.

DIEHLCRAFTER

The winter issue of the "Diehlcrafter," house magazine of the G. M. Diehl Machine Works, Inc., woodworking machinery builders of Wabash, Indiana, just released, reports on significant strides in cost control measures within the industry through equipment modernization. It also discusses the role of wood today in competition with other materials, and the importance of costs, conservation and more intelligent utili-

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zation—from the forests to the finished products.

The publication presents picture reports of how leading industries are putting modern machinery and modern production methods to work.

WOOD SCREW MANUAL

A technical information manual on wood screws has been published by Southern Screw Company, Statesville, N. C., manufacturers of a complete line of steel and brass wood screws, with either Phillips or slotted head styles. This manual gives all technical information of a general nature that may be helpful in the proper planning, use and ordering of wood screws.

The first pages describe various types of wood screws, give recommendations for boring pilot holes and information on the holding power of wood screws in various woods.

Other information includes approximate weight charts on wood screws in packages and in bulk, detailed drawings and complete specifications on slotted and Phillips head wood screws in flat, round and oval head styles, special head styles available and a decimal equivalent chart.

FLUORESCENT LUMINAIRE BOOKLET

A 24-page pocket catalog of fluorescent commercial and industrial luminaires is available from the Westinghouse Electric Corporation, Box 2099, Pittsburgh 30, Pa.

Detailed descriptions accompanied by photographs and diagrams of each of the luminaries tell where the respective types are best applied, what models are available, the features of each and their dimensions. In addition, a four page table provides convenient access to standard data on all the luminaires. The style number, description, and price of each is given.

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The New PEARSON Model "A"

Will not disfigure details of mouldings . . .

60% to 80% saving on sandcloth in sanding irregular shapes has been reported by many plants using a PEARSON MODEL A SANDER. Other cost saving features include sanding one or more stepdowns at same time, saving several costly operations; sanding of inside radii of circles and very flat tapered moulding. It is one of the fastest and most efficient sanders for irregular shapes on the market today! With the Pearson Belt attachment this model can be converted to an all-purpose sander at a small additional cost.

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WESTERN PINE GRADING RULES

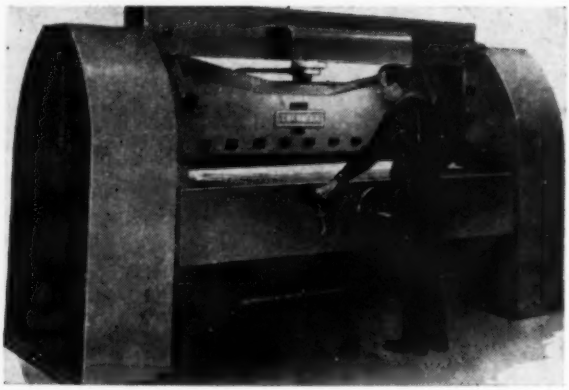
A completely new printing of "Standard Grading Rules" has been announced by the Western Pine Association, Yeon Building, Portland 4, Ore.

The new printing incorporates into the main body all supplemental rules adopted by the group since October 1, 1949.

The new edition also contains new rules for grading Engelmann spruce and select grades of lodgepole pine adopted at the association's September meeting in Portland. Measuring 3½"x6½", the book has 147 pages. A marginal index provides easy reference to rules for each species of western pines and associated woods.

Don't itch for something you're not willing to scratch for.

VENEER CLIPPER-JOINTER PROVIDES ADJUSTABLE KNIFE SPEED



A hydraulically operated veneer clipper-jointer features adjustable knife speed and hold down pressure, which, combined with a foot operated preliminary hold down system, is said to deliver extra cutting precision and additional ease of positioning veneers for "matched joint" clipping. The machine is offered by the Columbia Machinery and Engineering Corp., Hamilton, Ohio.

Clean, accurate cutting is achieved, according to the manufacturer, by speeding the knife action for short fiber veneers and by slowing the knife action for long fiber veneers. This knife speed variation is achieved by means of a fluid volume-adjustment valve.

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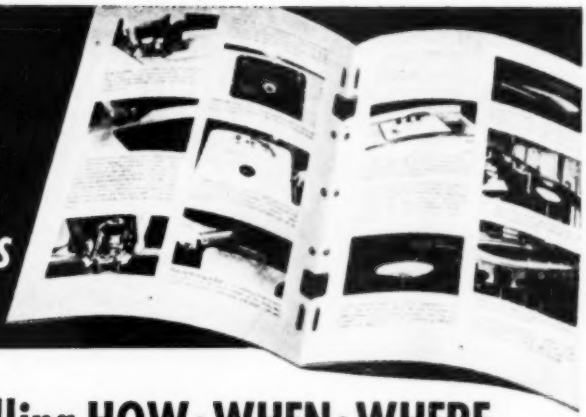

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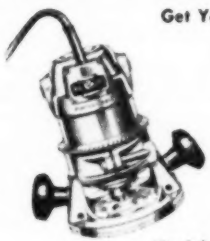

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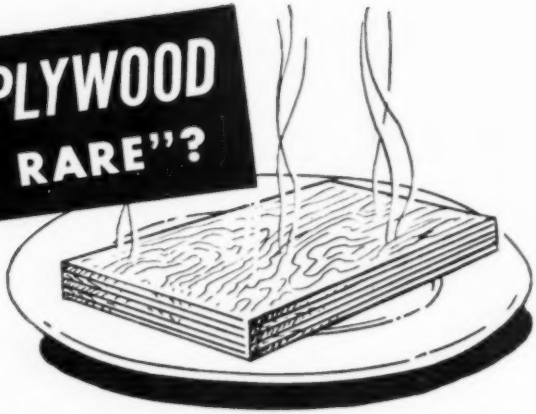

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Preparing Logs for Veneer Cutting

By Thomas D. Perry

IN MOST timber areas logging is a seasonal business, largely confined to winter weather in the north, and to the drier months in the south. On the west coast many logging operations can be active most of the year. Veneer logs, often called "peelers," must be of top quality, selected for soundness, straightness, free from knots and major defects. There are other criteria in some of the hardwood species, such as black walnut, birds-eye maple, curly birch, red gum-wood and white oak, where grain figure and color may add to the value of the log. After the veneer logs have been selected and marked, and usually they are a small proportion of those occurring in any area, the next lower selections are set aside, progressively, for saw logs, pulpwood, cordwood, etc.

On arrival at the veneer mill, by truck or railroad car, logs must be sorted for size, length, quality and species, and then scaled for wood content and marked. In some cases the scaling and marking is at the woods operation. Where log pond storage is in use, logs must be scaled and marked in the woods, followed by a tally sheet of the load on each transportation unit.

Log scales, by which the content and value of the logs are determined, vary in the different timber areas, and were originally based on the amount of lumber that could be sawed from a log. Slabs, edgings and sawdust are counted out. Consequently, a log averaging 18" in diameter and 16'-0" long, with a cubic content of 339 board feet, will scale, by Doyle-Scribner, 196 board feet, or some 60% of the total cubic content. A 24" diameter log, with 603 board feet content, will scale 400 board feet, or 66% of cubic content. Obviously there will be an overrun when cut into rotary veneer.

In most southern areas and on the west coast, log ponds are customary for storage, since most logs deteriorate less under water and can easily be floated to the drag chain. However, land piling is usually necessary, adjacent to the log pond, to store any surplus over the capacity of the pond.

Deterioration is a serious and costly problem in log storage and the degrade grows worse with every month of storage, especially in hot weather. Fungus growths, insect pests, end checking and discoloration are the major factors in this deterioration during storage.

Storage problems are closely interwoven with the amount of log inventory that is considered reasonable in any

This is the fourth series of descriptive articles that the writer and your editorial board have prepared and presented to the readers of WOOD WORKING DIGEST during the last three years. All have been intimately connected with the processes, materials and products which contribute substantially to the making of plywood.

In a recent review of the history of plywood, delivered at the Centennial of Engineering at Chicago in September, 1952, it was shown that plywood became commercially important about 1875. The advent of Douglas fir plywood in 1910-20 developed structural applications as a broadening field of plywood utilization, while resin adhesives, about 1940, demonstrated the techniques of making plywood thoroughly water- and weather-proof.

The growth of the plywood industry, in these 75 years, has been little short of phenomenal, and plywood has come to be recognized as a major branch of wood and lumber utilization, which in turn is the sixth largest of the manufacturing industries in the United States, according to the U. S. Census of Manufacturers. Dr. Wilson Compton, until recently vice-president of the National Lumber Manufacturers' Association, makes this comment: "The rise of plywood is one of the most dramatic and significant chapters in the history of the American Lumber and Timber Products Industries. . . . [The plywood industry] has now become an industrial giant."

The previous series of articles have been as follows:

"Cutting Techniques for Wood," 9 sections . . . April—December, 1950. Reprints of the series, from the publishers, 25c each.

"Gluing Techniques for Wood," 8 sections . . . January—September, 1951. Reprints in preparation by the publishers, 25c each.

"Types of Plywood," 14 sections . . . October, 1951—January, 1953. Reprints expected to be available later in 1953.

This present series on "Veneer and Plywood Machinery" will undertake to describe the machinery and mechanical equipment, to which reference may have been made earlier in the series. We shall start with the log yard, through the veneer cutting lathes and slicers, where the veneer manufacturing process begins, and continuing through the sanding machines, which give the final finishing touches to the dimensioned plywood. This new series will be supplementary to the processes, materials, and products of the plywood industry as they have been described, and will include many items of equipment not heretofore mentioned.

★ ★ ★ ★

given operation. Due to the seasonal nature of log production, it is obvious that it cannot be maintained on a hand-to-mouth basis. One northern company in the hardwood field has set the following pattern: minimum, 3 months' cut; average, 6 months'; and maximum, 9 months'. It is of course apparent that a 3 months' supply at the start of the non-logging season would be out of line. The inventory requirements are lower on the west coast, where logging can be more nearly continuous.

An example of an excellent storage procedure, one that has been proved economical in a Maine operation, is shown in Fig. 1. The craneway straddles the row of cooking vats and extends from the log pile at the far end of the craneway to the drag saw conveyor in the foreground, which leads to the drag saw (not shown).

Courtesy Allen Quimby Veneer Company.

Figure 1. Log piles, craneway and cooking vats.

The log pile, at the right rear and partly covered with snow, starts in a pit, some 6 to 8 feet deep, to keep all logs within the range of the derrick, and, with a maximum inventory, may extend some 20 to 25 feet above grade. The logs are transferred from the incoming trucks by derrick, piling the ends of the logs as close together as practicable to keep out the sun, which is the prime cause of drying and end checking. The entire pile is constantly sprayed, with water or steam according to the season, which largely eliminates end checking and substantially reduces the occurrence of other defects. Logs are brought under the craneway by derrick and truck in cable slings of five to ten logs and lowered into the cooking vats. The same process serves to lift the cooked logs from the vat and to place them where they can be rolled onto the drag saw chain, shown in the immediate foreground. The heavy steel plate covers for the cooking vats are also handled by the traveling crane.

An approximate ground plan of the photo in Fig. 1 is given in Fig. 2. Such a plan can be enlarged or reduced in size, or modified, so long as the changes do not interfere with log handling facilities. A waste conveyor runs to the fuel hog under lathes 10 and 11.

Cooking or Steaming Logs

The cooking vats, below ground, are of reinforced concrete, with special reinforcing at the corners to withstand the wide temperature variations, between 200° F. in the vats and zero or lower outside. It is important to have the interior of the vats as free of pipes as is practicable, to permit frequent

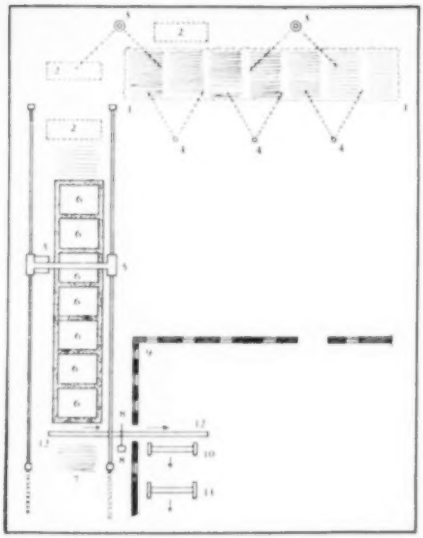
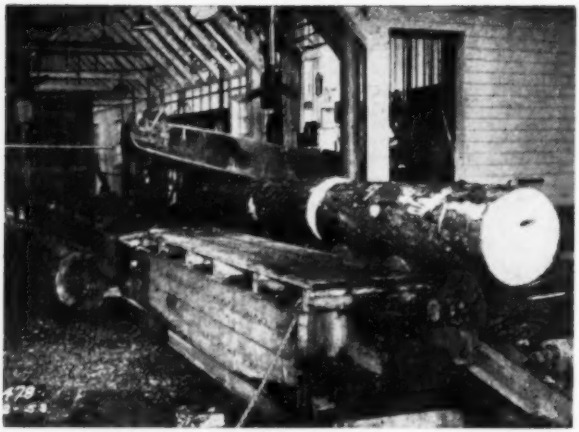


Figure 2. Ground plan of yard shown in figure one. 1. Log piles with lower tiers in pit; 2. truck stations for incoming logs and for logs to go under crane; 3. swinging derricks for handling logs between piles and trucks; 4. oscillating spray nozzles for wetting log piles; 5. traveling bridge hoist on craneway; 6. concrete cooking vats for softening fresh logs; 7. pile of cooked logs ready to be conveyed to drag saw; 8. drag saw for cutting logs into bolts; 9. corner of factory enclosure; 10. roughing lathe; 11. veneer cutting lathe; 12. chain conveyor, in "V," from vat to drag saw to roughing lathe.



Courtesy Merritt-Solem Corporation.

Figure 3. Chain drag saw installation.

cleaning out of the inevitable accumulation of bark and chips. Any pipes in the vats must be braced securely to prevent damage from heavy logs as they are lowered into the vats before cooking or removed after cooking. Water inlets and outlets should be generous in size, using plugged T's for turns, rather than L's, to permit opening the pipes to relieve clogging.

The temperature-time cycle in the vats varies with the species, log size and weather. In general a longer time and lower temperature is considered more effective in softening logs than a short time high temperature cycle. Authorities differ on the best cooking schedules. One that has given excellent results, with birch and maple logs, is a range of from 160° F. to 200° F. for four days; maintaining the higher temperature for the final day in the warmer half of the year, and for two days during the winter season. Some low density species, like basswood, are cut cold, without cooking.

In the Douglas fir areas on the Pacific coast, in the early years of the industry, logs were steamed before cutting. The practice fell into disuse for many years but is now coming back. It has been found that steaming softens the logs, substantially reduces the amount of rough cut veneer, and prolongs the cutting life of the veneer knives between grindings. Another factor in justifying the cost of steaming is the gradual worsening of the peeler log grades. A few years ago, many of these would have been graded as saw logs.

Cutting Logs into Bolts

There are several types of drag saws

Courtesy Merritt-Solem Corporation.

Figure 4. Accumulating bolts to be dropped into steam chambers.

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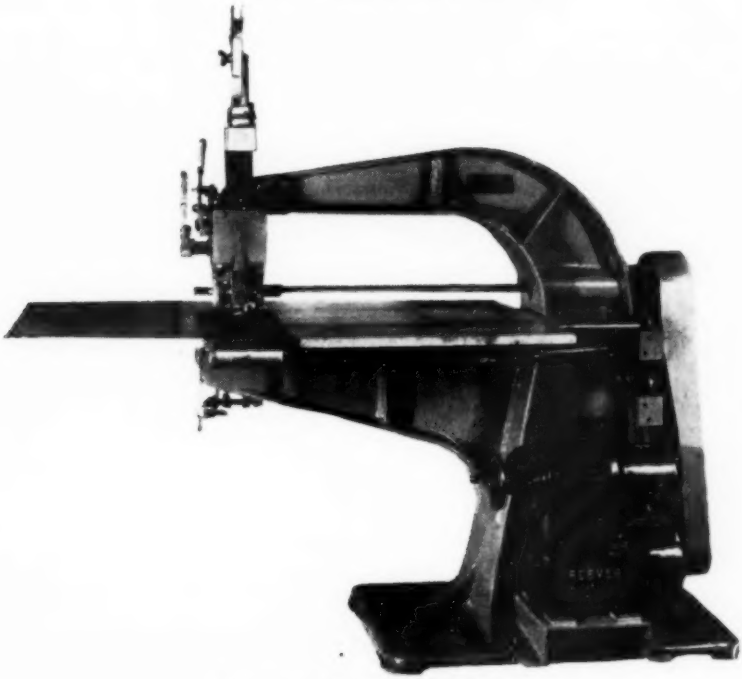

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Figure 5. Debarking the hard way.

used to cut logs into veneer bolts. The following are the more important:

Reciprocating Saws. These are sturdy heavy blades with large teeth and can be easily maintained. They are mounted on the end of a pivoted arm and dropped on the log in the conveyor. While a reversing cut is not as fast as a continuous cut on a circular, band or chain saw, the drag saw very seldom fails to keep up with the rest of the mill. This type has been used for many years and is still more frequently found than all the other types put together.

Circular Saws. These are faster cutting and as easily maintained as the reciprocating saws, but are far more hazardous to life and limb. Another objection is the size requirement; a 60" diameter saw for a 27" diameter log makes the setup awkward and clumsy.

Continuous Band Saws. These are highly efficient and fast cutting, but are not nearly as foolproof as the reciprocating saw. An expert mechanic is required to sharpen tension and keep them in good working condition. The bands are easily broken, becoming a serious menace to workmen in the immediate vicinity.

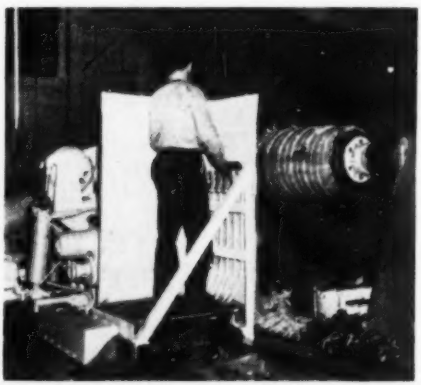
Chain Saws. These match the speed and efficiency of the band saws and are less dangerous. However, they cannot be maintained by the average saw filer, and require an adequate supply of spare cutters, rakers, links and pins for replacements. Replacing these parts to repair the saws is time consuming.

Bolts are usually cut with 2" waste allowance at each end, to be trimmed off by the spur knives in the veneer lathes.

In the log handling procedure shown in Figs. 1 and 2, the log is cooked before it goes to the drag saw. Smaller veneer mills with limited log handling facilities may prefer to cut the logs into bolts before cooking. Such an installation is shown in Fig. 4, where the drag saw is at the far right. The bolts on the conveyor chain move along the row of steam chambers. They can be rolled off on the platforms between the steam chambers and are easily rolled into an open chamber. The illustration is of a hardwood veneer mill which prefers to use steam (up to about 10 lbs. p.s.i.) rather than hot water to soften its logs for cutting.

De-barking Lathe Bolts

There was a time, not too many years ago, when it was customary to remove



Courtesy Allen Quimby Veneer Company.

Figure 6. Roughing lathe with spur cutters.

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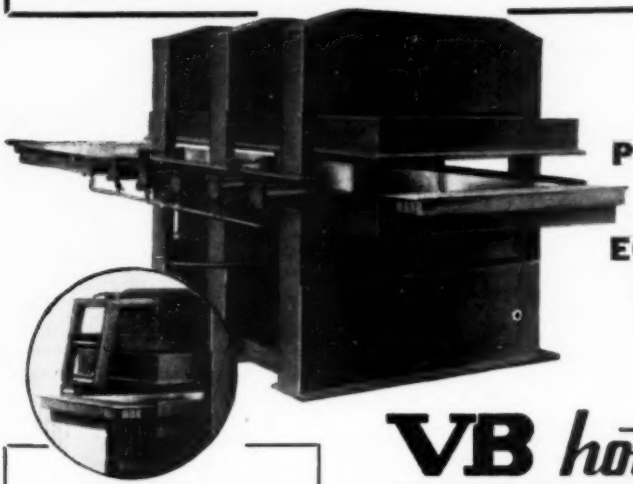

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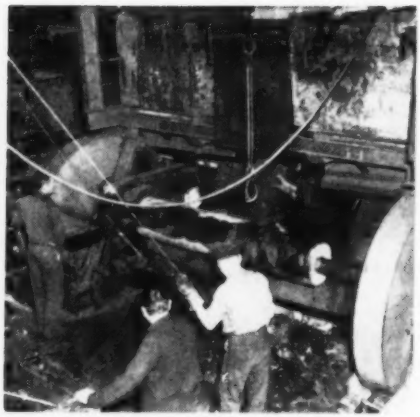

Courtesy Merritt-Solem Corporation.

Figure 7. Roughing lathe for debarking and roundup.

bark from freshly cooked or steamed veneer bolts, between the drag saw and the lathe, by "main strength and awkwardness," using heavy sharpened spuds, as shown in Fig. 5. Many mills still continue to use this method in spite of its untidiness, the accumulation of broken bark, and the steaming hot and slippery condition of the bolts. Workmen shunned the task as they would the plague. Many attempts were made to develop mechanical devices to solve this problem. Several of the more important will be outlined.

Hydraulic Debarking. This is an expensive method, as it requires water at a pressure of some 1200 lbs. p.s.i. and up to 1,000 h.p. to produce an adequate supply of water. It did not remove ingrown bark adjacent to knots and, so far as known, is no longer used in any veneer operation.

Rotating Cutters. The log is forced, more or less spirally, through a series of revolving cutter heads that cut and scrape the bark from all sides of the log. While it was an improvement in eliminating distasteful labor, it was a clumsy process and left a rough torn surface. It did not work well on crooked

or misshapen logs, although it has found considerable use on small bolts for pulpwood.

Traveling Cutters. This was essentially a stripped down standard veneer lathe from which the knife carriage and the pressure bar assembly had been removed and replaced with a sturdy shaft for the full length of the lathe. Traveling along this shaft was a cutter head that removed the bark progressively from one end to the other. Various types of cutter heads were used: revolving spur rolls, stationary heads with heavy spurs on the underside against the log, heavy slanting cutter chisels, and the like. Most of these cutter heads were made to follow the contour of the log, by weights, springs or pneumatic pistons in which the pressure could be regulated. In some instances the cutter head traveled in a straight line, reducing the log to a cylinder, which usually required several trips of the cutter head along the log. All of these devices produced a rough torn surface on the log, and most of them did not remove the taper of the log or any irregularities in shape. Mechanical debarkers of this type are rather widely used for large logs on the Pacific coast, but they have not been found as satisfactory for the smaller hardwood logs in the south and east.

Modified Standard Veneer Lathe. A subsequent development, especially adapted to hardwood logs, is a standard veneer lathe, stripped of the pressure bar assembly, but retaining the knife carriage. This is equipped with an unusually sturdy knife, ground to resist dulling, set for a heavy cut, about $\frac{1}{8}$", and operated at a speed of from 30 to 60 r.p.m. In many cases a series of spur cutters was added to cut the bark and the irregular pieces of outer veneer layers into short lengths for easier handling of the waste conveyor. Such a setup is shown in Figure 6.

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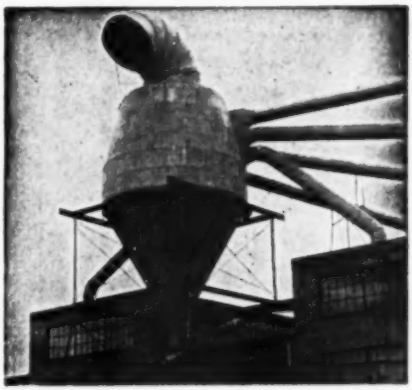

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This rounded the bolt, left a smooth surface for veneer cutting and provided the center prints for mounting the bolt in the veneer lathe. However, a considerable amount of outer sapwood was lost in the roundup.

The most recent step in debarking equipment is to remove the cross cutting spur knives from the above and salvage all of the first cuttings of irregular pieces of veneer which are of value. These are to be used for core stock where somewhat rough cutting is not objectionable.

It is a rather interesting and astonishing cycle starting from rather complicated and costly special debarking equipment, going through several traveling cutter head devices, and finally coming back to a standard veneer lathe, modified to do debarking, to salvage what usable veneer results from the roundup. At the same time the bolt was prepared for rapid and smooth veneer cutting on a subsequent veneer lathe fully equipped with all modern attachments. Perhaps there is a moral here, not to attempt to do elaborately with special equipment what can be done better with well-known standard equipment altered to meet the needs of the job. This modified debarking lathe might well be called a roughing lathe.

The setup of this roughing lathe, located between the drag saw and the veneer lathe, is shown in Fig. 7. Here the bolt has been partially debarked and the taper of the bolt is quite apparent. The waste hopper leading to the waste conveyor and hog can be seen below the log. The next rough bolt from the drag saw can be seen at the lower left corner. Above the roughing lathe is another chain hoist and pair of grab hooks to remove the rough and rounded bolt from this roughing lathe to the veneer cutting lathe mounted on a higher platform, behind the plywood shields and in the far rear of the photo, but not shown.

This preliminary rounding up of the bolt relieves the second, or veneer cutting, lathe of much of the delay and untidiness that are inevitably connected with the initial mounting of the log in the normal manner. These include centering, inspection for surface defects which might harm the knife, cutting out such defects and peeling off the irregular odd pieces down to where the veneer is usable. Rounding up on the regular veneer lathe can be time consuming if the veneer is thin. This clutters up the clipper chain and table with a substantial amount of waste. Using the roughing lathe in this way greatly increases the production potentialities of the veneer lathe and leads directly to major improvements in veneer cutting, which will be outlined in the next article.

The writer's appreciation and gratitude for supplying data for this article is extended to the Merritt-Salem Corporation, the Allen Quimby Veneer Company and the Douglas Fir Plywood Association.

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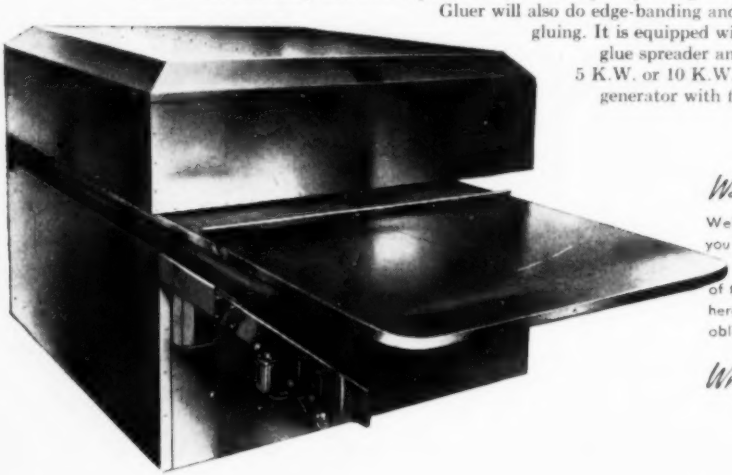

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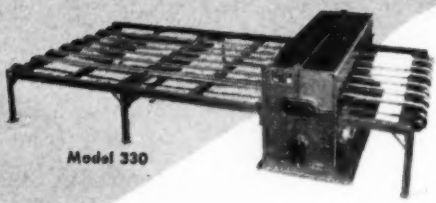

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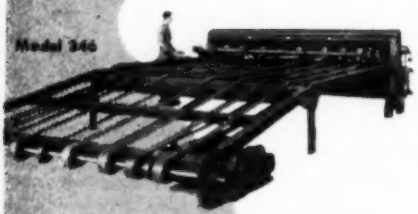

Coe Model 330 Automatic Panel Clipper. Multiple Knife for sizing single sheets of veneer in motion. Position of cuts are selected by means of a timing chain moving at same speed as veneer.

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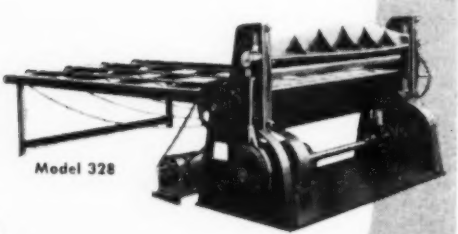

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VENEER and PLYWOOD

PART 26

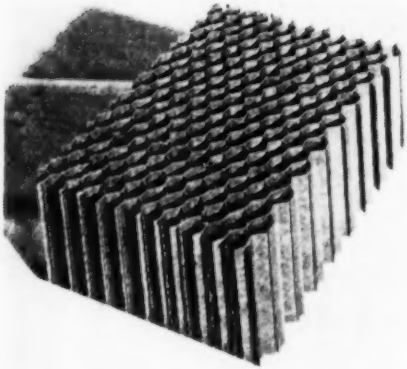
PLYWOOD PANELS WITH HONEYCOMB CORES

By Ned Bailey

THERE is probably no division of the woodworking industry that is now or has for the past two decades been receiving more attention than has the manufacture of plywood. WOOD WORKING DIGEST has given considerable editorial space to this important material. We have featured a special section on the subject for many years. The remarkable progress in the development of the many new and different forms of plywood can be attributed to the Forest Products Laboratory, Madison, Wisconsin, and the manufacturers of adhesives and plywood machinery. These, plus co-related groups and individuals, have done continuous research and spent hundreds of thousands of dollars to find out what we know today. This knowledge, plus the practical application of many of the products developed through their help, is actually changing our methods of living. This statement I will discuss in some future issue of WOOD WORKING DIGEST.

Several years ago at a meeting of the Wood Products Division of A.S.M.E. at Madison, Wisconsin, a very interesting paper was presented by a representative of the United States Plywood Co. His subject was "Honeycomb Plywood." Tom Perry was there and he prophesied that some day "honeycomb sandwich plywood" would be one of our most important forms of plywood.

Today it is well on the way to becoming just that. Though as yet not fully tested in many of its possible applications, the increasing demand for this so-called sandwich panel continues to grow, and with this demand the need for more data on the behavior of such panels under ordinary exposure conditions will increase. Tests being made now at the Forest Products Laboratory at Madison, Wisconsin, will be helpful in resolving some of the problems regarding large scale use of sandwich panels. The evaluation of the panels being tested there under average housing conditions will provide information applying to most other products in which the use of sandwich panels might be considered. The present and possible future use of sandwich plywood runs through sports, truck, bus, trailer and freight car construction, railroad passenger trains and airplanes,



One type of honeycomb material.

subflooring in homes and industrial buildings, walls, roofs, forms for concrete construction, boat building, furniture, built-ins, etc.

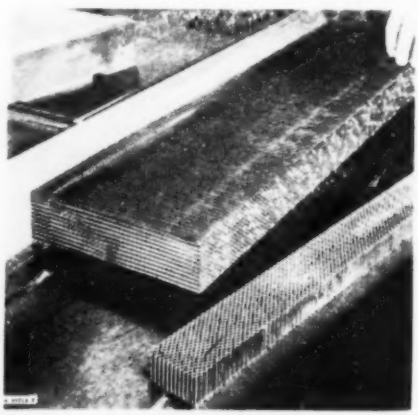
Perhaps you may find a use for honeycomb plywood in your business, or would like to manufacture it. With these thoughts in mind, herewith is some factual information on the subject. No attempt will be made to detail the actual or proposed uses of sandwich plywood panels. I have had in mind, however, such things as house construction uses, including partitions, doors, spandrel panels, ceilings, built-ins and flooring. Also, possible use in trailers, warehouses, farm buildings, lightweight shipping containers and large furniture will be discussed.

Because of the inherent structural strength of these panels, the greatest total benefit will probably be realized most by using them to carry the principal loads in a construction, rather than to provide the coverage alone. Lightweight, re-usable, strong containers of larger sizes also can be made of this material. Because of its qualities this plywood should also be given serious consideration by conventional, prefab and industrial builders. The general trend toward the use of sheet materials on the inner and outer surfaces of buildings indicates the potential value of sandwich panels as building material.

There is no doubt that both plywood and veneer mills are very much aware of sandwich panels as a means of increasing the value of peeler logs. Kraft paper manufacturers, too, are taking a lively interest in its development. Plastic and metal companies are wanting to know about the feasibility of using their materials as facing or strengthening elements. Metal companies in particular see in the sandwich panel an opportunity to use thin metal sheets for applications where they previously were not suitable.

Sandwich panels are attracting the attention of architects and builders because of their strength and lightweight, fire resistance and the thermal insulation afforded by the honeycomb core. Using fibreboard facing will also make high strength structural panels for industrial construction, providing additional uses for pulpwood and wood waste.

Fundamentally, making honeycomb from paper requires increasing the

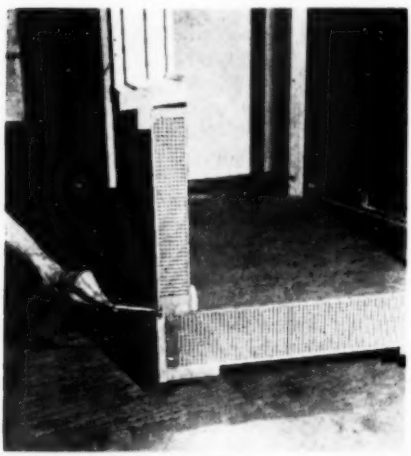


Sawing strips of sandwich core which will be turned on end in the final core.

bulk of dense paper to give much larger volume to a low-density cellular structure with certain predetermined properties. First the space between the sandwich facings has to be determined and then the honeycomb must be made to fill all the volume between these facings. The density of the core is therefore one of the key factors in economy, as the materials are relatively costly, particularly on a weight basis. Furthermore, the honeycomb must be made to provide the greatest possible volume consistent with adequate properties. A number of different corrugated Kraft papers can be used in the construction of sandwich plywood. The ultimate use of the plywood determines the kind of paper used for the core.

There is the expanded type core which we will refer to as No. 1. This consists of sheets of Kraft paper interspaced with parallel strips of adhesive and expanded to form hexagonal cell sections.

There is a looped or figure-8 type core, No. 2, that consists of sheets of paper looped and bonded to form circular cells.



Joint details in a mock-up of sandwich wall, floor and roof.

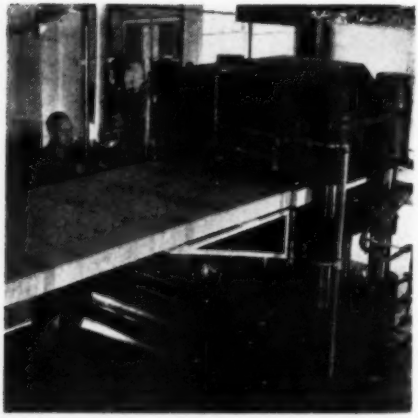
Assembling (experimentally) the layers of a sandwich core.

The core we call our No. 3 is referred to technically as PNL. It consists of corrugated sheets of paper assembled parallel to each other and separated by a single treated uncorrugated sheet.

The core designated technically as XN we here designate as No. 4. Its corrugated sheets are assembled with the principal flute direction of adjacent sheets at right angles to each other.

The type technically known as PN is our No. 5 and consists of corrugated sheets assembled parallel to each other and bonded at the crests.

There are several ways to increase the volume of paper for use as honeycomb core. Three of the more prominent types used for sandwich panels are expanded, figure 8, and corrugated. In the expanded type, sheets of treated paper are laid up and interspaced with parallel and uniformly spaced strips of adhesive. Successive strips of adhesive are placed so that the centers of any one layer are positioned at midpoint between the strips



Pressing faces on a sandwich panel.

of the preceding and the succeeding layer. Then the blanks, after bonding, are expanded to form hexagonal cell sections referred to in this article as No. 1.

In the production of No. 2, the figure-8 core is made with a ribbon of paper looped and bonded to form circular cells resembling a figure 8 in cross section. Special machines are required to form both the expanded and figure 8 type of honeycomb.

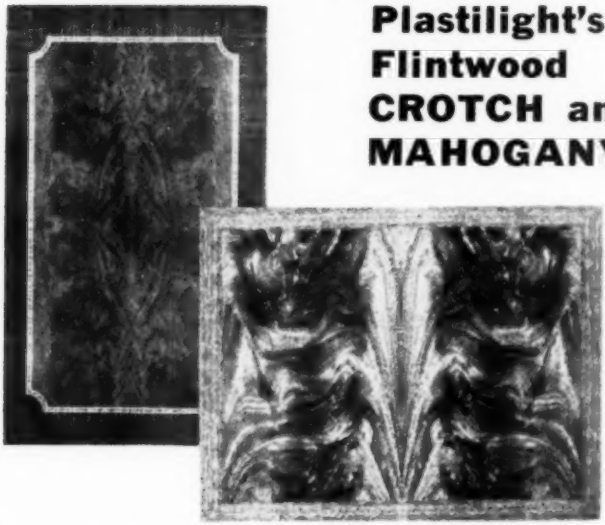
In producing the corrugated type, No. 3, the cell or flute is made by hot forming between fluted rolls on equipment of the type used in making corrugated container board. The corrugated sheet, with or without uncorrugated interleaving sheets, can be assembled in many ways. Recently more attention is being given to numbers 3, 4, and 5.

Before we go into that however, it may be well to point out that each type of core has its advantages and disadvantages peculiar to its construction. The differences are many because special equipment is required to produce each type of core. Then there are limitations in resins and adhesives. The manufacturers of these products are helping to solve these difficulties so successfully that they may soon be eliminated from the list. Cutting honeycomb accurately is also a specialized job. Here again manufacturers of cutting tools are helping to solve this problem. Other requisites which are rapidly being met are production of honeycomb of desired strength and cores with proper thermal insulation and core blocks designed for ease of shipment. Common to all types, No. 1 through No. 5, insofar as the base material and resin treatment are concerned, are the durability of fibre, quantity of resin used and strength and durability of facings.

Most of the data discussed here concern sandwich panels made from corrugated Kraft paper cores, for use in building construction panels as distinguished from use in aircraft. Particularly in the interest of low cost building material, much thought is given to the resin treatment of the base material and to the fabrication of the core and the completed sandwich panels. Strength properties, bowing, thermal properties, durability and fire resistance of the sandwich panels are also considered.

Because of its strength and availability in large quantities, an unsized neutral Kraft paper was used. Unsized paper was used in order to permit better resin penetration and because of favorable indications of permanence. For cores having cells a 30-pound paper (3000 square feet area) gave high strength properties. This paper yielded a core of a density of about 2.5 pounds per cubic foot. It was found that by redueing the weight of the paper from 50 to 30 pounds for any particular core construction a marked improvement in thermal values was achieved. Paper less than 30 pounds was considered unsuited to handling, corrugating and to the fabricating process.

THE 1953 SENSATION



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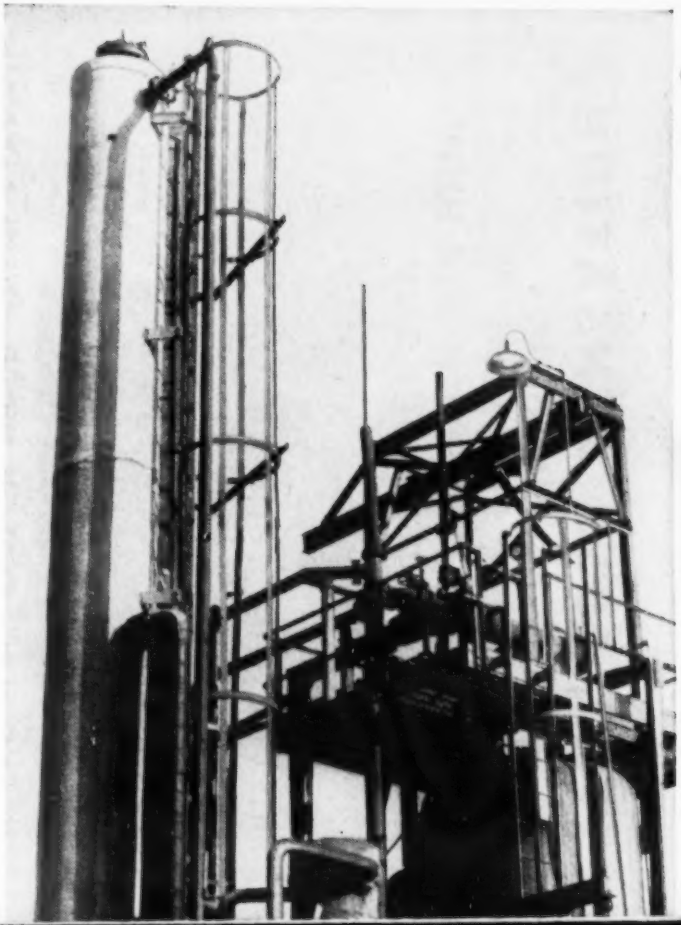

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The permanence of the resin saturated paper mentioned can be reasonably assumed inasmuch as such core material—when in the sandwich—is protected from the ultraviolet rays that effect loss of strength of paper upon aging. Although paper without resin might be used, only resin treated papers are recommended. Resin is necessary to produce a paper that will remain permanently strong and stiff in wet conditions. Small amounts of resin are sufficient to be considered effective. It has been found that in terms of tensile strength, a resin treated paper retains 75% of its strength when dry after a water soaking that would cause untreated paper to lose almost all of its strength.

The resins referred to are of the phenol-formaldehyde types. Two of them are of the water-soluble and alcohol-soluble types; both are suitable but have inherent differences when used with cellulose. Of the two, water-soluble resin seems preferable. The swelling effect on the fibers allows the resin to penetrate the fiber itself, causing the fiber to maintain a swollen state. A reduction is also caused in the equilibrium moisture content of the sheet with water vapor. In the absence of an additional swelling agent, alcohol soluble resin appears only to coat the fibers, resulting in a paper with an equilibrium moisture content as high as untreated paper. Wet, they both have about the same high level of strength. Decay tests showed about the same difference in value.

As a resin treatment, a 15% water-soluble resin (figured on weights of resin and fiber) is adequate to make a paper of good strength, when wet, decay resistant, and with excellent handling facilities during corrugation and subsequent fabrication. Above 15% the gain in strength, etc., is not justifiable,

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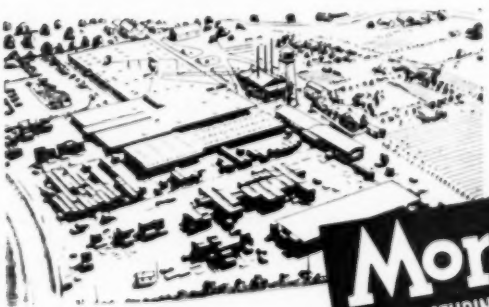

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although for certain uses lower resin content, down to 5%, is permissible; however, at this low rate an addition of 2% of pentachlorophenol is advisable to make the paper more decay resistant.

As an indication of the difference in strength of panels with cores having a 5% to 15% water-soluble phenolic resin treatment, the former, used in the No. 4 or XN type honeycomb core, with a 2.5 pounds per cubic foot density and bonded to similar plywood facings tested in both wet and dry conditions, showed the following results. When tested dry, panels with 5% resin content had a shear stress of 52 pounds per square inch and a compressive strength of 35 pounds per square inch. Increased to 15% the panels' shear strength was about 40% more, dry and 300% more when wet. The difference in compressive strength was not quite so great as in the shear strength.

The kind of material to use for facing honeycomb panels and the type of honeycomb that should be used are regulated by the end use of the panel. One of the most pronounced values of the honeycomb core is the wide variety of facings it will take, particularly thin sheet materials, due to the nearly continuous support by the core. To a large extent the strength of the sandwich as well as its stiffness and stability are determined by the nature of the facings. Some of the many different types of facings include plywood or single veneers overlaid with a resin-treated paper, hardboards, asbestos board, aluminum, enameled and stainless steel, magnesium sheet, wallboard, plastics, laminates and veneer bonded to metal.

Inasmuch as the facing is securely bonded to the core in the sandwich panel a two-ply veneer facing, with or without an overlay, can be used in

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making a flush door. Sandwich panels with dissimilar facings suitable for many uses are feasible but should be carefully made and used with considerable caution. For economy, panels with facings of hardboard or veneer and paper overlays are acceptable also because of their lightweight.

There are several methods used for cutting cores. The most important point, however, is to do the job of cutting the thickness desired accurately. This can be done on a circular saw, band saw, vibrating knife or the guillotine cutter. The method used is regulated by the type of core and the thickness desired. To avoid cutting, the core may also be made the desired finished thickness. Usually a circular saw will make an accurate cut. This is well adapted to a thin section. A band saw using the proper blade and run at the correct speed will cut the core to a tolerance sufficiently close for panels of two inches or more in thickness. A band saw having five teeth per inch, operating at a speed of 3,500 feet per minute, has also been found satisfactory for this thickness. Inequalities in the core thickness if within plus or minus .015 inch will ordinarily be taken up when pressure is applied to the panel in the press resulting in a uniform finished thickness of the panel.

As in any other plywood type panel, satisfactory performance of the sandwich panel depends largely on a good bond between the core and the facings. The adhesives and presses we have today are largely responsible for making possible the manufacture of the honeycomb plywood panel. However, although the adhesives available are satisfactory, the presses leave some things to be desired. The pressures required for this sandwich type panel are usually much lower than can be obtained in the range of good pressure control on an ordinary plywood or

plastic press. In view of the fact that pressure requirements are low and simple, we hope that less costly presses will soon be obtainable. Roller presses and bag-molding could be worked out but do not seem as practical as the regular multiple opening hot press. Cold pressing seems at present most satisfactory for panels with dissimilar facings. Here adhesive limitations, longer assembly time and possible durability of bond are brought into consideration. Undoubtedly, however, ordinary cold-setting adhesives are adequate for a host of sandwich panel applications.

Strength tests conducted on large size sandwich wall panels, three inches thick and having plywood facings, indicated higher shear strengths developed in bending and greater resistance to vertical loads than found in equivalent walls used for conventional house construction. These panels withstood maximum loads in bending of at least 12 times the design loads of 20 pounds per square foot, sometimes used for house panels.

The fire resistance of plywood faced sandwich panels was found to be appreciably higher than hollow panels faced with the same thickness of plywood. In most cases, the sandwich cores were badly charred after the test but to a considerable extent retained their original form. One test exposed one face of the panel to a standard flame, approximating conditions of a fire in a house in which the furnishings were being burned. In this test, the fire resistance of the plywood faced sandwich panels was appreciably higher than the conventional hollow panels faced with the same thickness of plywood. When aluminum faced panels were exposed to the heat, a rather rapid buckling of the face and failure of the bond occurred. The core, however, retained its original form to a large extent.

Another fire test consisted of intro-

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ducing flame through a hole in the facing as might occur at the openings for electrical conduit or other house equipment. To simulate this condition a small hole was cut in the facing exposing the honeycomb and a flame was directly applied to the hole for about four minutes.

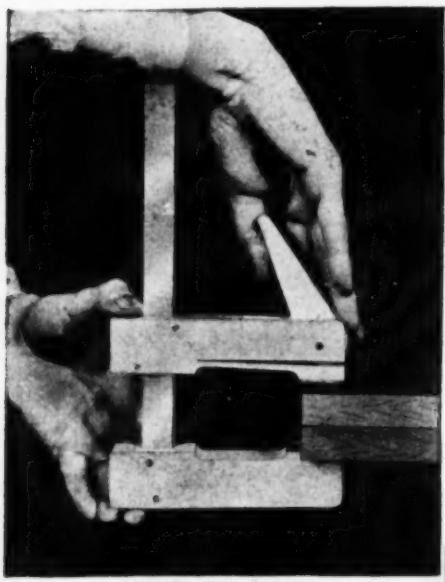
In this test, in panel numbers 1, 2, 3, and 5, burning was restricted to the honeycomb material in contact with the flame. When the flame was removed, flaming stopped immediately. Some glow continued for about two minutes. However, in No. 4, in which one-half of the flutes are parallel to the length of the panel, the flame spread in a vertical direction, due to the open channels.

It is evident that the fire resistance of the sandwich panel, which is good in some types, such as numbers 1, 2, 3, and 5, can be greatly improved by incorporating in the core foamed resin or a coating material such as one of the sodium silicates. Research may come up with the answer in the form of a combination that will bond the paper sheets, provide foam for fire resistance and improve the thermal insulation.

Photographs through the courtesy of the Forest Products Laboratory, Madison 5, Wisconsin.

DR. C. AUDREY RICHARDS

Dr. C. Audrey Richards, long one of the nation's outstanding research pathologists, died recently in Madison, Wisconsin. She had retired in February, 1953, from her career in forest pathology research for the U. S. department of agriculture. For many years she headed this work as chief of the Division of Forest Pathology, Bureau of Plant Industry, Soils and Agricultural Engineering. She was the first woman to hold such a post. She will be missed by the entire forest products industry.



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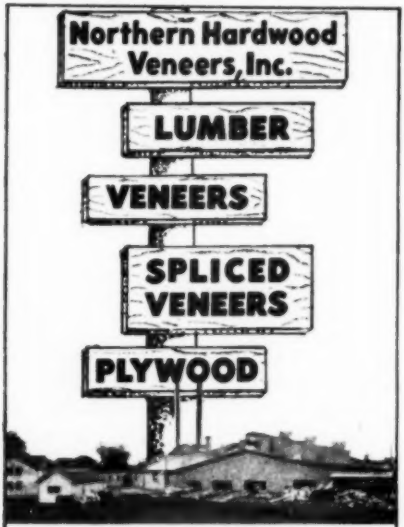

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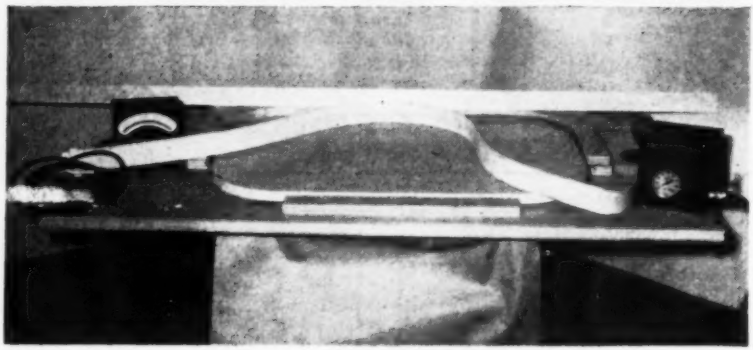

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MODERN ELECTRIC EQUIPMENT FOR THE LUMBER INDUSTRY

This is the name of a booklet issued by the General Electric Co., Schenectady 5, New York. This publication begins with an illustration of the log pond and describes operations through to the finishing mill. Special point of emphasis in the booklet is the fact that lumber mills often find it economical to generate their own electric power. The book is well illustrated and written especially for the woodworking industry.

LINK-BELT FOLDER

A new folder, No. 2437, describing Link-Belt Beyl friction clutches and clutch couplings has been announced by Link-Belt Company, 307 N. Michigan Ave., Chicago, Ill. It includes schematic drawings and dimensional tables that enable the engineer to select the right clutch or clutch coupling for each requirement.

Beyl clutches are available in 10 standard sizes, ranging from 2¾ to 125 h.p. at 100 r.p.m. Positive action and easy adjustment are featured.

Romance of the TABLE SLIDE

By Fred B. Walter

This is a story about table slides—an item well known only to the table manufacturer. There are a number of companies in the United States which make slides. Here is the story of B. Walter & Company, Inc.

IN COLONIAL days a cabinetmaker made your table. A simple job, requiring simple tools. Then came the need for tables of adjustable size. The increasing mobility of people brought about by the newer modes of travel increased the need for a dining table which could be changed to suit the crowd. With rooms growing smaller, permanently large tables became very inconvenient.

From the standpoint of furniture manufacture, table slides have been growing in importance because of the great variation in types of tables. This makes it essential for someone to specialize in the engineering and manufacturing of such constantly changing items.

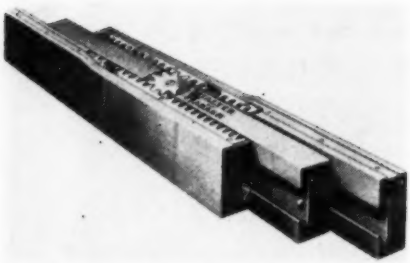
Tables did not require too much in the way of machinery, but when the need came to vary the size of a table, complications arose. Sliding mechanisms required precision machinery, a different inventory of lumber and a lot of engineering "know-how."

As our country grew, factories to manufacture furniture became common. In the early days, however, one factory made chairs, another made tables, still another made beds and dressers and another made buffets or sideboards so that production could be increased and costs held down. Various woods were used—walnut, birch, mahogany and oak.

In order to buy furniture for a dining room, the products of several companies making special items would have to be assembled. There was not much chance of any two pieces matching either in wood, finish or style. The buying public began to demand dining room furniture in sets that would at least match up; so furniture factories developed complete lines. This helped the buyer and started the manufacturer on a program which resulted in better design, leading up to the period furniture of today.

As production of dining tables increased, making table slides became more and more of a problem. To help solve this problem three small factories started to make table slides about 1880. One was located in Dayton, Ohio, one in Watertown, Wisconsin, and one in Huntington, Indiana.

In 1887 Bossler Walter, the founder of B. Walter & Company, Inc., formed a partnership with Thomas B. Hennessey, who operated the table slide factory in Huntington. It was then moved to Wabash and Mr. Walter bought full ownership. He formed B. Walter & Company and started production in a small way. The table manufacturers soon realized that they could increase their production and save money if they could buy slides ready to apply, without the inconvenience of having to make them.



Four-section table slide.

In 1893 B. Walter & Company moved into a new factory. The next five years were depression years and the going was rough. By 1897, however, business was better and the company was on a firm foundation.

The table slide that B. Walter & Company was making in 1894 was a tee-groove slide with a steel spring, which was patented. Along about this time Bossler Walter conceived the idea that a dovetail slide would be much cheaper to make and much easier to assemble.

He took his problem to Toledo and presented it to a manufacturer of wagon and buggy building machinery to see if machines could be made to manufacture this slide. This first machine was built at a cost of $250.00. Then he had to find a machine that would feed the slides through the machine. That cost $300.00 more.

Quite a lot of money in those days; but with these machines in operation, production was stepped up and output increased.

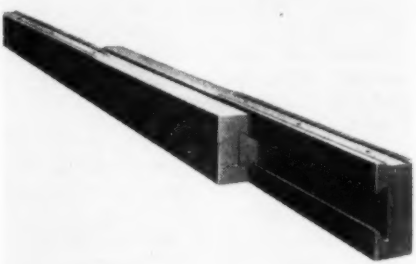
During the period from 1898 to 1906 the country in general prospered. In 1906 Bossler Walter became ill and his son, Fred B. Walter, now president of the company, left his work with the General Electric Company of Schenectady, New York, and came home to run the business.

Production was low and orders stacked up. Under the new management, some changes were made. More machines were added and the company was ready to go into big expansion when the money panic of 1907 hit. This did not hurt too much but slowed business.

In 1908 Bossler Walter passed away. Following his death, B. Walter & Company was incorporated. In 1910 B. Walter & Company, Inc., purchased the table slide plant in Dayton, Ohio, moving it to Wabash. This practically doubled the output and an expansion program was started.

Lumber prices were low up to 1914, ranging from $20.00 to $30.00 a M log run. Table slides were made from six and eight quarter lumber and finished 2 $^{3}/_{4}$" wide. As the business expanded, freight became a factor. To reduce freight it was decided to make some slides 2$^{3}/_{8}$" wide instead of 2$^{3}/_{4}$". This helped reduce cost to the manufacturer without hurting his product. This was later cut still further both in width and thickness, permitting the use of table slides on the west coast at a fair price.

Patents have played their part in the extension table business. When an equalizing slide was first put on the market, quite a few manufacturers claimed patents. Then someone dug



Equalizer slide.

up an old English patent dated 1804 which covered everything and left the manufacture of equalizers wide open.

After the fight over equalizers was settled, B. Walter & Company, Inc., started to make them. A hardware department was added to make top locks, folding leaf hinges, folding leaf equipment, refectory slides and a few other items.

High-speed steel has been a big factor in reducing the cost and increasing the production of table slides. By the use of high-speed steel precision bearings and automatic feeds, B. Walter & Company, Inc., has increased the feed on molders to better than 100 ft. a minute. At the present time, beech, oak, maple and ash are used to make slides. To get a satin finish that needs no sanding at 100 ft. a minute, 16 hours a day, is no easy job. It takes "know-how."

B. Walter & Company, Inc., known to the trade as "Walter of Wabash," has kept up with the ever-changing styles in extension tables. In today's small home, the long heavy extension table is almost a thing of the past. New designs have entered the picture. Smaller tables with one or two folding leaves are in demand for breakfast tables in prefab houses. Gate-leg extension and console extension are needed in small apartments. Each of these tables takes a special slide plus other hardware, and requires quite a little engineering to get the right combination. Today there are many variations in slides and many types of folding leaf equipment and other hardware in the B. Walter line.

The winner usually wins by a small margin—an hour, a minute, a second, a year, a foot, an inch. It's the little extra effort that puts him across.

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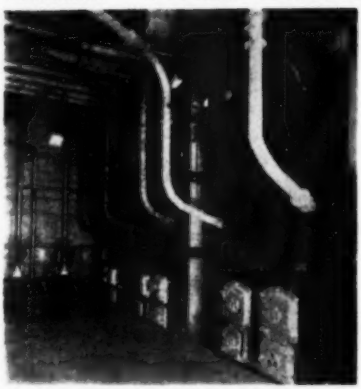

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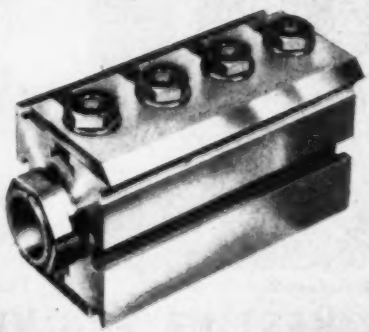

MACHINERY AND TOOLS SINCE 1904

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ACCIDENT-FREE WORKERS

By James F. Van Namee

AN ADEQUATELY trained and properly supervised worker is usually an accident-free worker! This is true because people are most often involved in industrial accidents because they violated instructions or never received instructions not to perform the unsafe act which caused the injury. In either instance the underlying responsibility for the accident rests with the injured employee's supervisor.

Therefore we may safely say that one of the solutions to the problem of accident prevention depends upon good on-the-job instruction given by the employee's immediate supervisor.

In order to achieve effective on-the-job instruction, it is essential that each supervisor have a fundamental knowledge of the correct and, therefore, safe methods of performing each job duty under his supervision.

Much has been written on the subject of job instruction. A review of most of it reveals that the problem is three-fold — namely: (1) preparation, (2) instruction, and (3) supervision.

Careful planning for job instruction is of extreme importance. An easy and effective method of determining job requirements is to prepare a written breakdown of each job operation. This analysis breaks down each duty into (1) its elementary steps, (2) an explanation of necessary skills for an easy and complete knowledge of the job and (3) a notation at each job step regarding the accident possibilities and safety precautions required.

Following the establishment of the job requirements, it is important to:

1. Establish a timetable keyed to the learning capacity of the individual trainee.

2. Determine the point at which training should be terminated to avoid waste of time.

3. Have the necessary equipment, materials and supplies available to avoid confusion.

4. Be certain that all safety regulations are contemplated and adhered to.

Upon the completion of the necessary preparatory steps the supervisor is

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ready to proceed with the actual phase of job instruction. At this point, it is desirable to establish the following certain basic facts with and about the trainee:

1. The determination of how much he knows.

2. The importance of safety.

3. The importance of quality and quantity.

Under normal circumstances, it is desirable to instruct on an individual basis. However, this is not always possible. Where group instruction is necessary, it must be remembered that optimum success can only be achieved by pacing the tempo of instruction to the average learning capacity of the group so that they will not be retarded by a slow worker or discouraged by the pace of an unusually fast learner.

It is suggested that the supervisor establish the following sequence of steps in teaching each job duty.

1. Tell how to do the job. Give a complete and detailed description of each step emphasizing the special knacks and safety factors.

2. Show how to do the job. Proceed slowly showing each step so learner can study each movement. Repeat each step several times and at this point encourage questions.

3. Have learner do the job. This is the opportunity to observe the learner's efforts to duplicate the performance of the instructor. This is an important stage in job training as many characteristics of the employee—such as knowledge of the job, learning capacity, comprehension, etc.—are revealed to the instructor. Each deviation from the method used for instruction should be pointed out and explained. This procedure should be repeated until the new employee can explain and perform the job well enough to be placed on his own.

School Dage!

Just because that bathing suit is proper at the beach, she shouldn't assume it's proper for the classroom, too!

And just because one bearing is best lubricated by one particular grade of oil, you shouldn't assume that the same oil is best for *all* bearings on that machine. In many cases it isn't.

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4. Check job performance frequently. This phase of follow-up is essential to quality and quantity production. It reveals how well the new worker is following the job instructions given. Each deviation from the methods taught should be explained and instructions repeated if the errors warrant such action. Once it is obvious that the learner is performing satisfactorily, the follow-up can be tapered off until normal supervision is all that is necessary.

It has been said that "the end of training is the beginning of supervision." Successful supervision is dependent upon patience, observation and perseverance. The importance of supervision can best be illustrated as the key to continuing safe production of a quality product.

Man is a creature of habit. There-

fore, as he progresses in his job he develops work habits which can be good or bad. The purpose of "supervision" is to detect and correct mistakes before they actually become habits.

Every job has its complete cycle. A piece of stock may be ripped on a saw in a matter of seconds while operations on shapers may take considerably longer. Yet both of these jobs have complete cycles. Each must be observed throughout its complete cycle several times before the foreman can be certain that the job is being performed as originally planned.

New employees usually try to do what is expected of them. However, when deviations are observed the supervisor should point them out to the employee and aid him in getting rid of the causes. Poor work habits are not formed by making mistakes once. Likewise, one reprimand will not break a habit. Therefore, "supervision" must continue until every indication of unsafe practices ceases to exist.

Up to this point the correction of poor work practices has followed a destructive process. The technique of modern supervision suggests following this negative process with a program of building up the worker. This can be achieved by continuing the "supervision" with compliments given when it is observed that the original instructions are being followed. Thus we insure fixing the worker's habits into a desired pattern.

Whenever supervisors attach proper significance to on-the-job instruction and follow through, the result will invariably be smooth, uninterrupted, safe production.

A pun is the lowest form of wit—unless you say it first.

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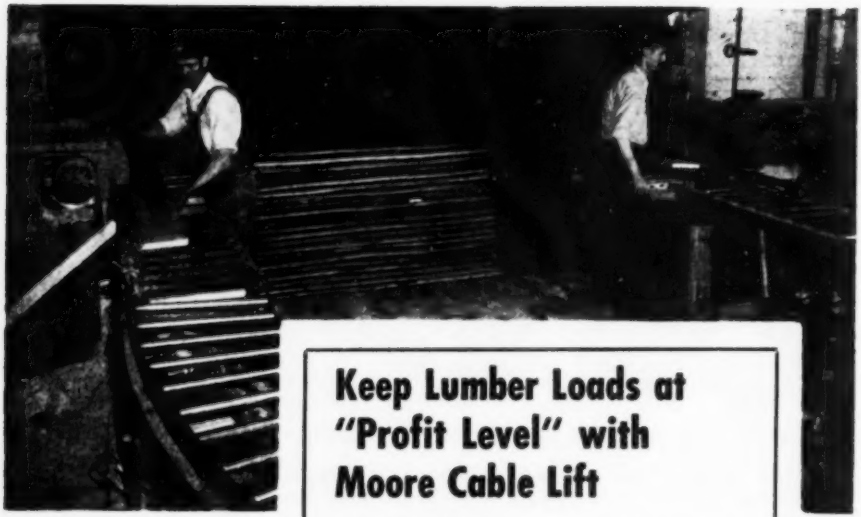

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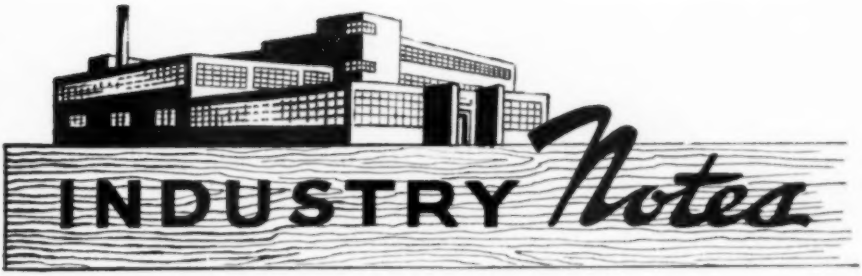


CHICAGO FURNITURE SHOW DATES

Dates have been set for the semi-annual Chicago furniture markets through 1958. The dates in the three years 1956-1958 were determined by a formula. Most years the market will open on the first Monday after New Year's, but in no case earlier than January 4 nor later than January 10. Here are the dates for coming markets: 1953, June 22—July 3; 1954, Jan. 4—Jan. 15, June 21—July 2; 1955, Jan. 3—Jan. 14, June 20—July 1; 1956, Jan. 9—Jan. 20, June 18—June 29; 1957, Jan. 7—Jan. 18, June 17—June 28; 1958, Jan. 6—Jan. 17, June 16—June 27.

HARDWOOD GRADING COURSE

Instruction and practice in hardwood lumber grading will be provided during an intensive, five-day course for business and industry men at State University of New York College of Forestry, Syracuse, N. Y., March 30-April 3.

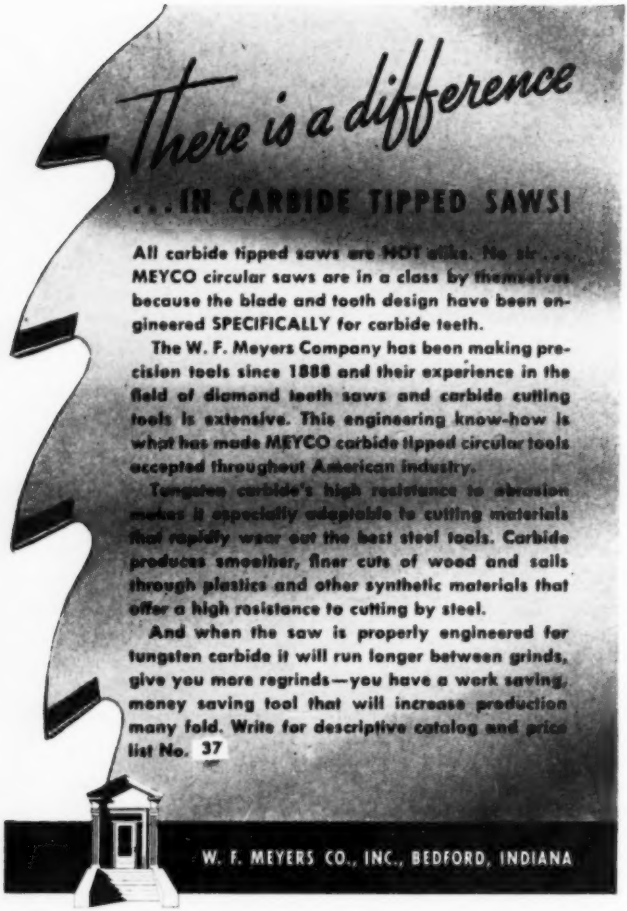
Facts and methods to be covered in the school are as follows: preliminary studies, standard grades, standard inspection, special inspection and practice in grading.

The school is also offering a course in practical techniques in seasoning and kiln drying lumber and wood products April 20-25. The course will be given by men drawn from industry and from the faculty and research staff of the college. Industry men appearing as guest lecturers and demonstrators will cover instrumentation, heating systems, veneer drying and kiln drying topics.

COURSE ON CARBIDE TOOLS

The University of Michigan School of Natural Resources and Extension Service recently sponsored a course on the use and maintenance of tungsten carbide wood-cutting tools. It was intended for those concerned with maintenance and design of cutter heads and cutting and woodworking tools. Instruction was given by faculty members and manufacturing engineers and specialists. One day was spent touring the Carboloy department of the General Electric Company. The group also attended a one-day course in the Carboloy department's regular customer training school. They saw how tungsten carbide metal was made and formed into cutting tips.

The illustration shows Ted Weill, woodworking specialist with General Electric, demonstrating method of torch brazing a tungsten carbide tip to a steel shank.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The W. F. Meyers Company has been making precision tools since 1888 and their experience in the field of diamond tooth saws and carbide cutting tools is extensive. This engineering know-how is what has made MEYCO carbide tipped circular tools accepted throughout American industry.
Tungsten carbide's high resistance to abrasion makes it especially adaptable to cutting materials that rapidly wear out the best steel tools. Carbide produces smoother, finer cuts of wood and sails through plastics and other synthetic materials that offer a high resistance to cutting by steel.
And when the saw is properly engineered for tungsten carbide it will run longer between grinds, give you more regrinds—you have a work saving, money saving tool that will increase production many fold. Write for descriptive catalog and price list No. 37
W. F. MEYERS CO., INC., BEDFORD, INDIANA

F.P.R.S. DATES

Here are the dates for coming sectional meetings of the Forest Products Research Society.

March 5-6: Eastern Canadian section, Royal York Hotel, Toronto, Can.

April 16-17: Two-day meeting of Ohio valley section at Chester B. Stem Co., New Albany, Ind.

May 6: One-day meeting of Northern California section at San Francisco.

May 7-8: Two-day spring meeting of Northeastern section at Portland, Me.

June 15-17: F.P.R.S. Seventh Annual National Meeting, Memphis, Tenn.

CONTINENTAL SCREW COMPANY

The Continental Screw Company, with headquarters in New Bedford, Mass., announces a change in its Detroit address to 10428 W. McNichols Road, Detroit 21, Michigan.

INDIANA HARDWOOD LUMBERMEN MEET

The Indiana Hardwood Lumbermen's Association held its 55th annual meeting recently. Officers elected for the new year are: president, J. Bruce Urbahns; first vice-president, Donald S. Mattson; second vice-president, R. E. Hollowell, Jr.; secretary-treasurer, R. C. Brundage of the Department of Forestry and Conservation, Purdue University, Lafayette, Indiana.

PLAQUE AWARDED DEPENDABLE

Dependable Machine Company of Greensboro, N.C., designer and manufacturer of the electro-unit drive molders was recently awarded a plaque for excellence in design of these machines. The plaque was awarded by "Design News."

For current literature on woodworking equipment, refer to our "Help Yourself" page.

ROHM & HAAS EXPANDS PLANT

Rohm & Haas Co., Philadelphia, has announced completion of an eight million dollar addition to its Deer Park, Texas, chemical plant, near Houston. The new unit will produce both ethyl acrylate and methyl acrylate using a process based on the acetylene chemistry of the German scientist Dr. Walter Reppe, and perfected by Rohm & Haas chemists and engineers.

TOOL SCHOOL

The North Carolina State College, Raleigh, N. C., has announced a short course in the grinding and maintenance of carbide tools for machining wood. This will be held April 13—18, 1953. Reservations should be made immediately for this course which will be held at the university.

The course has been planned to cover saws; knives for straight cuts—straight

this sword challenges CANCER

Under the sign of the cancer sword the American Cancer Society seeks to save lives by spreading vital facts to you, your neighbors, and your physicians . . . by supporting research that will find the final answers to cancer . . . by providing improved services for cancer patients.

Only under the sign of this sword is there a three-fold, national attack on cancer.

Cancer Strikes One in Five
Your Dollars Will Strike Back

Mail Your Gift to "Cancer"
Care of Your Local Postoffice

AMERICAN CANCER SOCIETY

NOW! JIFFY Carter TIRES

STANDARD EQUIPMENT ON

DELTA
CRESCENT
BAND SAWS

Delta Crescent
20" Band Saw

Proof of Acceptance . . .

Delta-Crescent has joined the ranks of *leading* band saw manufacturers using CARTER Jiffy Tires as standard equipment because . . .

- *Jiffy Tires can be changed in 10 minutes*
- *Provide 2 to 4 times more wear*
- *Provide perfect traction*
- *Jiffy Tires are safe . . . won't throw at any speed*

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CARTER PRODUCTS COMPANY, INC.

423 Wm. Alden Smith Bldg. 30 Ionia Ave., S. W.
Grand Rapids 2, Michigan

and spiral; knives for detail cuts—hand ground, milled to pattern, precision ground to pattern; relative advantage of carbon steel; boring bits; router bits; correct selection, etc. The instruction method chosen will be lectures to cover the "how" and "why." Two-thirds of each student's time will be devoted to practice by actually doing the job. The course is for men who are now doing or expect to be doing grinding or maintenance of saws, knives or cutters in factories which use power tools for cutting wood. Tuition is $50.00. This covers everything except living expenses while in Raleigh and travel.

For additional information write to Division of College Extension, P. O. Box 5125, State College Station, Raleigh, N. C.

F.P.R.S. ANNUAL MEETING

The seventh annual meeting of the Forest Products Research Society will be held June 15-17 in Memphis, Ten-

Smooth Dovetailing

WITH

WYSONG & MILES BITS

For longer life and greater accuracy insist on Wysong Dovetail Bits. Six popular sizes in carbon and high speed steels available from stock.

WYSONG and MILES Co

GREENSBORO, NORTH CAROLINA

DOVETAILERS • MORTISERS • SANDERS

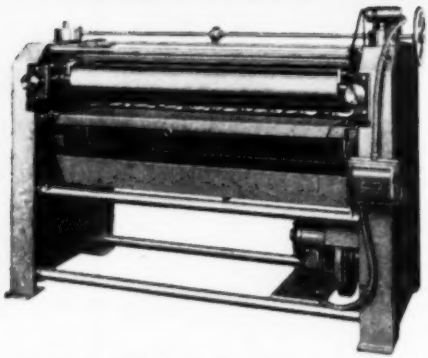
nessee. It is expected that at least 400 members will attend. Purpose of the meeting is for the exchange of pertinent information and analysis of mutual problems in the interest of new and better methods and increased utilization of wood and allied wood products. Several plant tours are being arranged.

Monday, June 15, will be given over to the themes of quality control, glues and gluing. Tuesday will cover chemical utilization, containers and protective materials, wood finishing and wood composition board. The last day will center attention on wood machining and equipment. A detailed program will appear in a later issue of WOOD WORKING DIGEST.

HASSALL BUILDS NEW PLANT

The John Hassall Company, a 102-year-old firm now operating in Brooklyn, N. Y., has announced plans for the con-

a UNION machine...
TO MEET ANY WOOD GLUING NEED



Name of Union agent in your territory supplied on request.

•

Write for your free copy of Union Booklet, "The How's and Why's of Wood Gluing," by Thomas D. Perry.

UNION TOOL CORP.
300 EAST MARKET STREET
WARSAW, INDIANA

UNION SERVES OVER 2,000 SATISFIED CUSTOMERS

UNION AUTOMATIC ROLLER COATER

Unexcelled for accurate, economical operation in spreading all types of coatings. Standard models take sheet widths from 12" to 108"; thickness variance from 0" to 2". Available with hollow rolls to permit circulation of cold water through them, thereby prolonging the pot life of resinous adhesives. A reduction of 15° will double your pot life. Available with rubber-covered doctor roll at no extra cost.

•

Union makes equipment for every standard production job in wood gluing. Also designs and makes machines for special applications—including machines for electronic gluing. Write for data on the complete Union line.

• • • •

USERS SAY UNION CUTS COSTS — SPEEDS PRODUCTION

struction of a new plant in Westbury, L. I. The company, originally established in 1850, started in New York City and moved to Brooklyn in 1888.

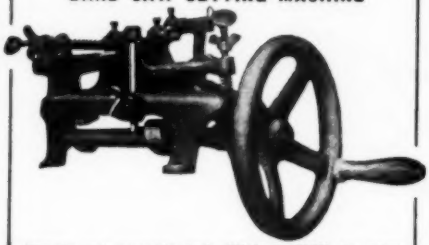
The new building will cover approximately 88,000 square feet. The architectural design of the building will blend with the landscaping, using a buff face brick, light blue-gray, long-coursed random ashlar stone and limestone as the general architectural feature of the building. The firm now employs 125 men and women, but the new plant will be able to accommodate a work force of 200. The plant will be located on Cantiague Rock Road between Northern State Parkway and Jericho Turnpike.

VICTOR KRIEG MOVES

The Victor J. Krieg Company announces its move to new and larger quarters. Formerly situated at 51 W. 52nd St., the firm is now at 611 Broadway, New York 12, N. Y. The company is sole U. S. representative for Scintilla Ltd., Switzerland, makers of the Lesto hand saw.

Tact is the knack of making a point without making an enemy.

SIMPLEX
BAND SAW SETTING MACHINE



Simple yet accurate and efficient. Will do more and better work than any other machine of its kind.
The vise takes saw blades 1/8"—1½" in width and by automatically gripping the saw while tooth is being set, prevents twisting of narrow saw blades. The feed finger is adjustable to teeth with ¼"—5/8" spacing, point to point.
All adjustments for different widths, teeth, etc. are regulated by but two thumb screws.
Best working speed 100 revolutions (200 teeth) per minute, each revolution setting two teeth. A saw can be set in 4 to 5 minutes.
The machine can be fitted with a flat or V pulley for power operation if desired.

Further Details Upon Request

ZEILLER & NAGEL, INC.
232 JAVA ST. BROOKLYN 22, N. Y.

Supreme BAND SAWS

END YOUR TROUBLES

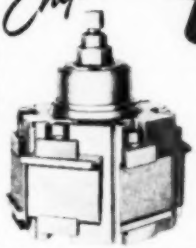
SUPREME BAND SAWS cut faster . . . have increased cutting capacity with minimum breakage! Present day high speed equipment demands Supreme Saws. Free from kinks and imperfections. Made from the finest Special Nickel Alloy Steels, tempered for toughness . . . to stay sharp! There is a Supreme Band Saw for every industry . . . for every material.

Special purpose saws are made to order.

WRITE TODAY FOR YOUR COPY OF THE "SUPREME" CATALOG NO. WWD

THE SAW & KNIFE SPECIALTY CO., INC.
4224 CARNEGIE AVENUE • CLEVELAND 3, OHIO

SHIMER Engineered for Production
EASED EDGE HEAD



for clean, fast, low-cost

- EASED EDGING
- MATCHING
- PLAIN JOINTING
- SIDING
- SHIPLAP

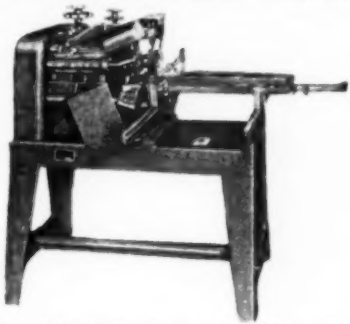
Here is a ruggedly built cutter head designed for extreme long service under the severest cutting conditions, yet a head that can't be surpassed for ease in adjusting, accuracy in pattern cutting and versatility of use! Six-bit model (pictured) and four-bit model both equipped with self-centering feature and clearance-protected, milled-to-pattern bits that hold their pattern permanently!

WRITE FOR YOUR FREE COPY OF OUR ILLUSTRATED PATTERN BOOK!

SHIMER

SAMUEL J. SHIMER & SONS, Inc.
85 RACE STREET • MILTON, PENNA.

HARRIS
DELUXE FLOOR MODEL TENONER

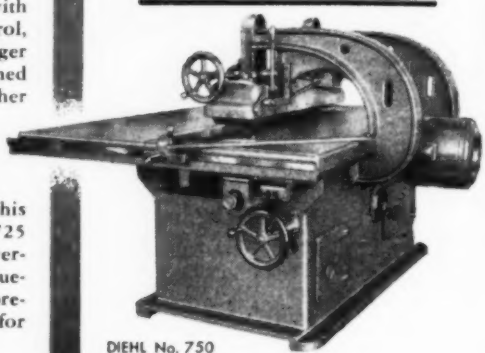


New adjustment allows exact and simultaneous adjustment of tenon spindles.
3 H.P. Motor.
3 Inch Blades
V Belt pulley drive on both tenon and cope spindles.
Heavier Construction for greater accuracy

MILLBURY MACHINE COMPANY
13 WATERS STREET, MILLBURY, MASS.

Teamed... for Production

DIEHL No. 725
Cut-off Saw

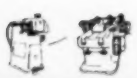


DIEHL No. 750
Glue-Joint Rip Saw

● DIEHL Dependable Cut-off and Glue Joint Rip Saws form a "production starter" team that keeps a steady and fast flow of precision-sawed stock rolling toward money-in-the-till completion.

Because Diehl saws operate with less vibration, better stock control, greater safety; because they give longer trouble-free service, they have gained unquestioned leadership. Like all other fine Diehl Precision Production Machines, they are the standard for comparison in the industry.

Yes, wherever high speed, precision cutting is required, you find this *unbeatable combination*—the DIEHL 725 Automatic Cut-off Saw and the powerful, smooth working DIEHL 750 Glue-Joint Rip Saw. See your DIEHL representative or write to the factory for descriptive folder.



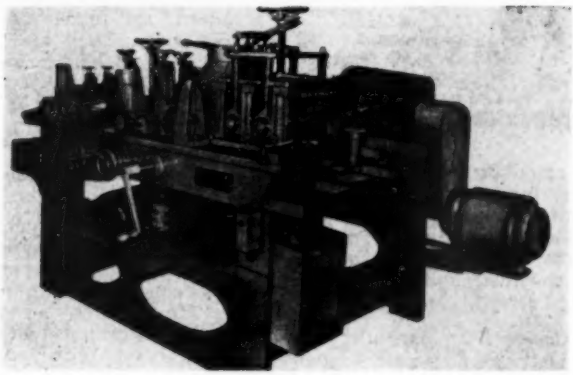
On the Banks of the Wabash

THE G. M. **Diehl** MACHINE WORKS, INC.

WABASH, INDIANA • U.S.A.

EQUIPMENT and Supplies for the WOODWORKING INDUSTRY

TIMESAVERS SPEEDMOULDER



Recently Timesavers, Inc., 32 N. Clinton St., Chicago, added three additional sizes to their line of Speedmoulders. Formerly available in 4" and 6" only, the line now includes 8", 10" and 12" sizes.

All models of the Timesaver Speedmoulder are now equipped with five motors, a separate motor driving each spindle and another for the feed works. A new heavy outfeed table support with bridge type pressure bar support has been added to insure firm support for the work as it passes over the bottom head. Fully adjustable in all ways.

The 8", 10" and 12" machines have adjustment controls for the in and out movement of the inside head from the outside of the machine. Top head is raised and lowered by a crank on the outside of the machine. These models are also equipped with a jointing attachment for accurate jointing of knives.

The feed speed on all models is infinitely variable between 20 and 100 feet per minute. Special attention has been paid to the design of these machines to facilitate and speed the ease of setup.

EXHAUST FANS BY DEPENDABLE

Dependable Machine Company of Greensboro, N. C., announce the ad-

Reduce Costs by assembling your products easier and stronger with "Rockford" Quality Controlled Threaded Fasteners.
We manufacture a complete line.
Cap and Set Screws
Socket Head Cap and Socket Set Screws
Studs
• Machine Screws and Stove Bolts
Nuts — Square & Hexagon
• Wood Screws and Drive Screws
• Sheet Metal Screws
Carriage Bolts
Specials
Aircraft Screws & Bolts
• Made in Slotted or "Rockford-Phillips" Heads
"Quality Controlled Products"
"ROCKFORD"
Screw Products Co.
2501 S. Ninth Street
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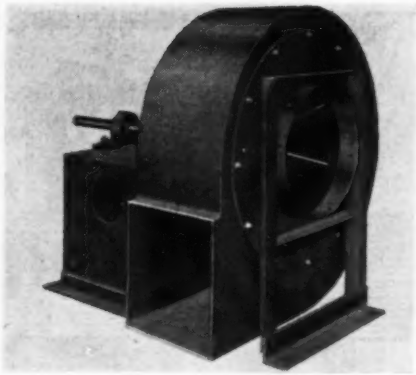
Phone: 4-9441 or Teletype: RK 88



dition of a complete line of exhaust fans to their line of products. These extra-heavy duty fans have been designed specifically for use in woodworking plants and saw mills for the removal of sawdust, shavings, chips, dust and wood scraps.

These fans have been carefully designed and engineered so as to give the utmost in service. They are rigid and compact. Side plates are removable so that the housing may be rotated to give any arrangement needed for the discharge unit. Interchanging of the side plates allows the rotation of the fan to be changed.

The blast wheels for these fans are designed to be as rugged as they can be made under the latest engineering and fabricating techniques. They are of open type construction and the long, heavy steel blades have extra heavy braces which are solidly welded into a single unit. Each blade is securely welded into a precision machined steel hub. All wheels are statically and dynamically balanced for smoother operation and to insure long life, it is said.

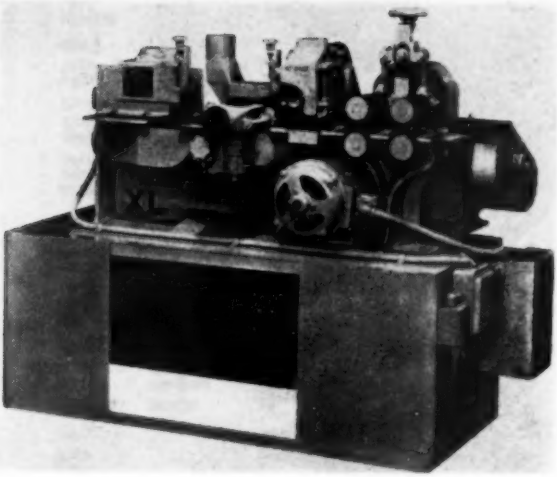
These exhaust fans are made in standard, six blade models from 20" to 80" sizes. They are made in slow speed, twelve blade models from 30" to 80" sizes.

SYNCO 925 ADHESIVE

Snyder Chemical Corporation, Bethel, Conn., introduces Synco 925, a fast curing adhesive, providing waterproof, durable bonds between porous and nonporous surfaces. With room temperature cure, joints normally may be handled within one-half to three hours after glue-up. With heat, cure can be effected in a few minutes. Synco 925 does an outstanding job in bonding aluminum, stainless and porcelain-enameled steel to wood, honeycomb and plastics, the manufacturer says. This is described as a thermosetting copolymer emulsion producing tough, flexible films and is recommended for applications where excellent heat, water, and solvent resistance are required.

NEW XL MOLDMATCHER

Smithway Machine Company of Seattle, Washington, manufacturers of the XL line of woodworking machinery



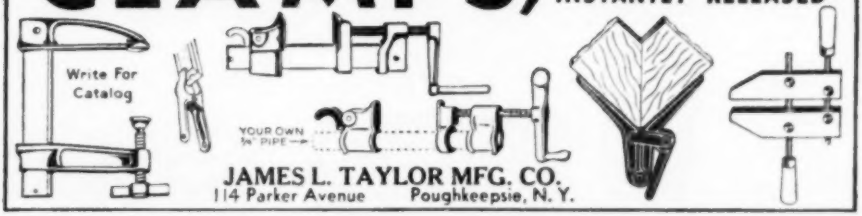
announce their 25th anniversary. The company was founded 25 years ago by O. P. Smith. Mr. Smith has directed the progress and growth through the years, and is still very active in his capacity as president.

They have also announced a new series of the XL Moldmatcher. The present model, known as the "3000 series," is made in two sizes: 2" x 4" and 2" x 6" capacities. Features include sectional type spring loaded chip breakers and research-engineered spindle design. All spindles are mounted on precision ball bearings, cutter heads turn 6000 r.p.m. Adjustments have been made more accessible and weight added to the main frame of the machine. Top and bottom cutter heads are belt-driven by a 10 h.p. motor. A 5 h.p. motor belt drives side heads. Feed drive system, powered by a $1^1/_2$ h.p. motor, permits feed speeds from 10-80 f.p.m.

Spindle design on the 3000 series is backed by two years' constant research and testing on machines operating under every kind of condition. Lateral adjustment of side and bottom heads has been provided.

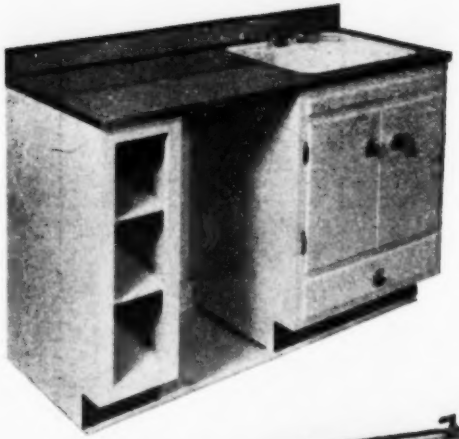
The manufacturer claims that the sectional-type spring loaded chip breakers require 50% less power than types formerly used. Weight of the main base casting has been increased for greater rigidity and smoother performance.

CLAMPS, INSTANTLY ADJUSTED INSTANTLY RELEASED



JAMES L. TAYLOR MFG. CO.
114 Parker Avenue Poughkeepsie, N. Y.

so lovely...and so rugged!



They're topped with

NEVAMAR®

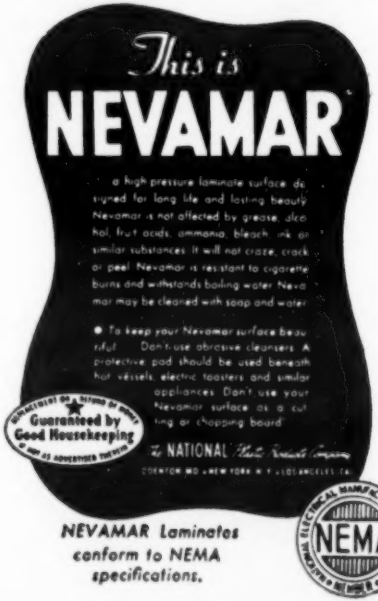
the pre-finished surfacing material

Milady will never have to worry about spilling nail polish or other cosmetics on these vanities. They're surfaced with NEVAMAR—the colorful high-pressure laminate that's as beautiful as it is durable. You simply wipe away every trace of stain from a NEVAMAR top. It's designed for a lifetime

counters or cabinets, NEVAMAR puts

NEVAMAR top. It's designed for a lifetime

counters or cabinets, NEVAMAR puts extra beauty, extra value and years of added service into your product. It is available in a wide range of attractive colors and patterns, including authentic wood grains. Get all the facts about NEVAMAR now. We will gladly send you samples.


This is
NEVAMAR
a high pressure laminate surface designed for long life and lasting beauty. Nevamar is not affected by grease, alcohol, fruit acids, ammonia, bleach, ink or similar substances. It will not craze, crack or peel. Nevamar is resistant to cigarette burns and withstands boiling water. Nevamar may be cleaned with soap and water.
To keep your Nevamar surface beautiful: Don't use abrasive cleansers. A protective pad should be used beneath hot vessels, electric toasters and similar appliances. Don't use your Nevamar surface as a cutting or chopping board.
Guaranteed by Good Housekeeping
The NATIONAL Plastic Products Company
ODENTON, MD. • NEW YORK, N. Y. • LOS ANGELES, CAL.

NEVAMAR Laminates conform to NEMA specifications.

NEMA

DISTRIBUTOR: THE NEVAMAR COMPANY, BALTIMORE-30, MARYLAND

The NATIONAL Plastic Products Company

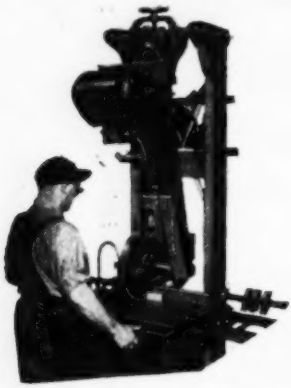
Manufacturers of Nevamar Decorative and Industrial Laminates • **SARAN FILAMENTS** • Wynene Molded Products

ODENTON, MARYLAND • NEW YORK, EMPIRE STATE BUILDING LOS ANGELES: 5025 HAMPTON STREET

TILTING ARBOR SAW

Heston & Anderson, Fairfield, Iowa, have announced the addition of a new 8" tilting arbor saw to the company's line of woodworking equipment. The new saw, known as Model 852, is of heavy gray iron construction and features a motor that tilts with the saw.

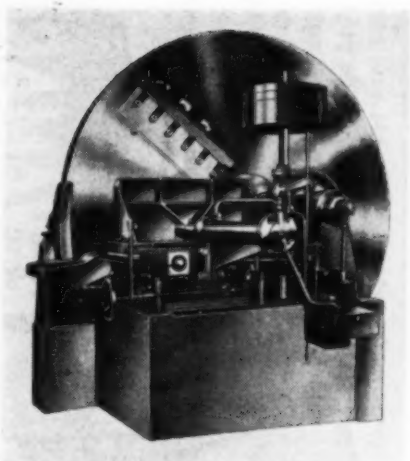
According to company officials the motor feature keeps the same tension on the belt and makes possible complete alignment of parts at all times.



Other features stressed by the company include life sealed ball bearings for protection against dirt and dust, miter gauge slots on both sides of saw, a modern steel floor stand and easily accessible controls, sawdust chute, large 26" x 20" cast iron table top, extra long aluminum rip fence with accurate gauge, and splitter with safety guard attached. The saw measures 12" from the blade to the front of the table.

ROTARY MACHINE SLICES BOARDS FROM LOGS

This machine will slice a 20"x24"x48" log into boards of any desired thickness from 1/32" to 5/8" at the rate of 120 boards per minute. Furthermore, the job is done without the usual loss from chips and sawdust, resulting in a yield of approximately 98%. Particularly important is the fact that this machine will handle not only square stock, but round stock left over from peeling machines, short butts and top ends of trunks.



The machine—available from the Plycor Co., Div. of the Earle Hart Woodworking Machine Co., 565 W. Washington Blvd., Chicago—is quite simple. The large rotary disc cutter has two knives set into machined-in recesses. The worktable, on which the log is placed, is equipped with an oil-hydraulic feed mechanism which pushes the log against the disc. No clamping of the log is necessary and it may be of any shape, round or square, whole, halved or quartersawed. In fact, several logs may be sliced at one time, one above another or side by side, we are told. The cutting process is started by moving a single lever and the operation continues automatically until stopped for reloading. The rotary sliced material is ejected at the rear of the machine in uniformly timed succession.

This machine would appear to be particularly practical for the manufacture of box and crate shooks as well as thin material for baskets and containers. It should be equally advantageous in the production of boards, panels, veneers, laths, etc.

The rotary wood slicing machine is made in three sizes. Type 45/180 has a

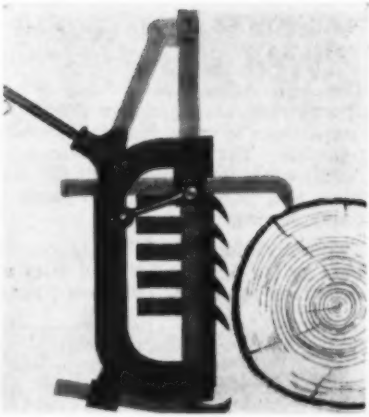
maximum cutting length of 16 inches; Type 86/265, maximum cutting length, 33 inches; Type 134/370, maximum cutting length, 52 inches.

NON-DEFACING CARRIAGE DOG

A new non-defacing carriage dog that will accommodate any size cant from 3-1/2" to 20" without adjustment has recently been announced by the McDonough Manufacturing Company of Eau Claire, Wisconsin.

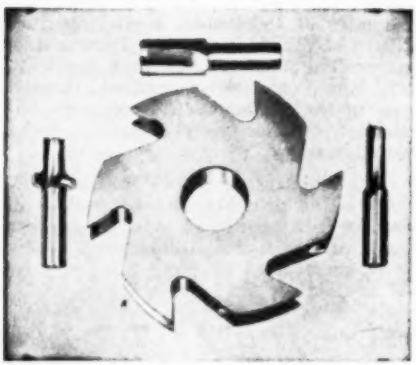
This non-defacing carriage dog has a series of five teeth so arranged that those below the top of the piece to be held are automatically pushed back out of the way and the one above the piece will hold it firmly when the closing lever is pulled down. This lever works on a positive cam action which locks the dog and holds the piece firmly until released.

An upper spur dog is also provided which can be adjusted to hold logs up to 40" in diameter.



It is claimed that the simplified action of the new McDonough carriage dog saves considerable time because no adjustment is necessary. It also improves the quality of sawing because of the positive grip with which it holds the cant or log.

Sterling Quality
Woodworking TOOLS

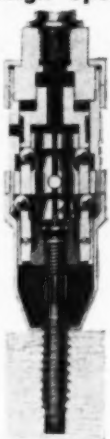


Router Bits - Form Cutters
Shaper Cutters - Sash Cutters

Some dealer territories open

STERLING CUTTER & MFG. CO.
728 Sixth Street **Rockford, Illinois**

***High Speed* HANGER BOLT**
DRIVING...



A FAST OPERATION TIMED IN SECONDS!

This tool is used by a majority of plants where hanger bolt driving is done on a high production basis. Can be operated at any speed which is safe for driving the hanger bolt. (It is not necessary to stop rotation at any time.)

- AUTOMATIC TAKE-UP FOR WEAR ON JAWS
- REVERSING POSITION OF CLUTCH GIVES DOUBLE WEAR AT HALF COST
- AFFORDS ACCURATE PROJECTION HEIGHTS
- USE WITH ANY AIR OR ELECTRIC DRILL OR DRILL PRESS

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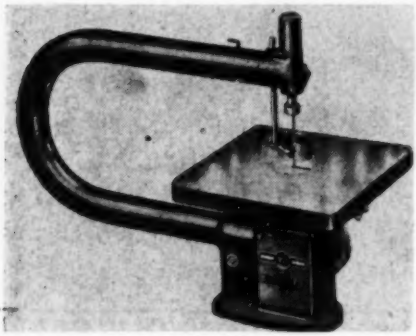
TITAN TOOLS

TITAN TOOL CO.
Production Tools
49 Main St., FAIRVIEW, PA.

ATLAS-POWER KING 18" JIG SAW

The new Atlas-Power King 18" incorporates advancements in design and construction to give easier, smoother jig-sawing. The overarm swings out of the way for saber cutting large boards and panels. Swing it back for regular sawing.

The new chucks hold all blades and sabers up to 5/16" wide and files and accessories up to ¼" diameter shank.



No adapters or extra chucks to buy. To cut long stock from the side of the Atlas-Power King, insert the blade in the 90° chuck slot.

Other features include: new, smooth automotive-type drive; splash lubrication; 11" x 11" precision ground table with double trunnion support; efficient blade guide and work holddown.

The manufacturer is the Atlas Press Company of Kalamazoo, Michigan.

SPINGRIT SANDING SPINDLES

Sanding and grinding curves are made easier and more economical by the use of Spingrit sanding spindles, a development of the Spingrit Company, 16557 Greenfield Rd., Detroit.

Straight strips of abrasive in a wide range of grits are quickly spiral-wrapped around the Spingrit sanding spindle and securely locked at both ends, making a fine precision tool which

can be chucked into any drill press, flexible shaft, lathe head or electric drill.

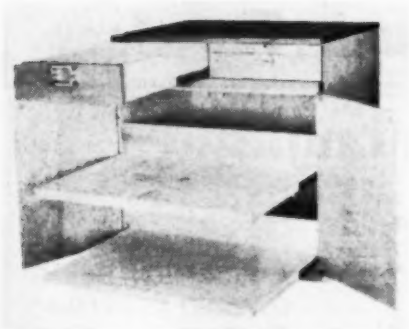
Spingrits are available in sets which include ¼", ½", ¾" and 1" diameter sizes in a polished wood case, with an assortment of strips and instructions.

SIMPLIFIES CASE CONSTRUCTION

The Extension Drawer Support Company, 2319 W. Washington Blvd., Los Angeles 18, California, is offering literature about its extension drawer supports. The firm tells us that case construction can be simplified through use of the supports. The company will furnish the necessary details to interested readers.

The illustration shows that shelving, as well as drawers, can be pulled out to its full length. Besides a working area of 24" x 36", this utility cabinet consists of two drawers. One drawer, 5" x 16¾" x 22"; one drawer, 3½" x 16¾" x 22"; one cutting board, 16¾" x 22"; one table, 34½" x 22"; two sliding shelves, 34½" x 22".

There is no framing between the cutting board and the drawer, or the drawers and the table, or the table and the cupboard below. The only horizontal framing is the top and above the toe space at the bottom. You will note that there is a horizontal cross piece



below the table. This piece is merely used for the door catches and has no supporting significance.

The cabinet can be made as a separate unit or incorporated in the design of any cabinet arrangement. It is ideal for small kitchens in homes or apartments where cabinet area is limited, because the storage area of the sliding shelves alone will give more usable storage space than ordinary shelving. It would take a cabinet of face frame construction half again as large to store all the articles conveniently that this cabinet will store.

SLEEP SHOW

April 17-29, 1953, has been set aside as National Sleep Show. The purpose of the show is to introduce new models, new styles and constructions in sleep equipment which have been developed during the last year. Pillows, mattresses and other bedding will be featured.

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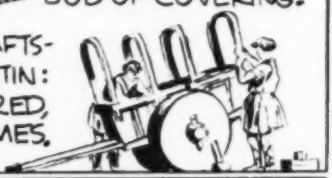
Mechanics Through The Ages

In XIV Century England

CERTAIN BODY ARMOR WAS LINEN COVERED. TO PREVENT WORTHLESS ARMOR FROM BEING COVERED, A LAW WAS PASSED IN 1322 FORBIDDING LONDON SMITHS TO COVER THE ARMOR THEY FASHIONED. THESE SMITHS WERE OBLIGED TO DELIVER UNCOVERED ARMOR TO FOUR JUDGES WHO FIRST PASSED ON THE MERITS OF THE WORK ——THEN GAVE THE ARMOR TO THE TAILOR WHO DID THE ACTUAL JOB OF COVERING.

CARPENTERS WERE ORIGINALLY CRAFTSMEN WHO MADE THE "CARPENT" (LATIN: CARPENTUM) ——THE HEAVY, COVERED, UTILITY CART USED IN ANCIENT TIMES.



OLD-TIME SCOTTISH BLACKSMITHS SWORE THAT THE CHARCOAL MADE FROM PEAT BURNED WITH GREATER HEAT THAN ANY OTHER FUEL. THE TROUBLE OF CONVERTING WAS GREAT——AND IT WAS NECESSARY TO USE BLACK PEAT WHICH USUALLY WAS DUG UP FROM CONSIDERABLE DEPTH.

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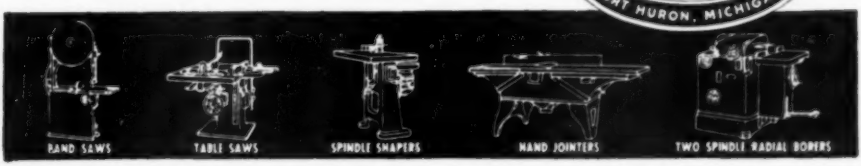
Get the facts **on Moak Band Saws right away. Write for our colorful booklet.**

MOAK MACHINE & TOOL CO.
MOAK
PORT HURON, MICHIGAN



The Market Place

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Lists of Used and Rebuilt Machinery, either For Sale, Wanted, or For Exchange, set in uniform style, will be published in the Classified Section at the rate of $7.50 for name and address and o five line advertisement. For additional lines, only 75c per line.

DISPLAY ADVERTISEMENTS: 1 inch (Minimum), $8.50; 2 inches, $17.00; 3 inches (Maximum), $25.00.

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585 W. Washington Blvd., Chicago 6, Ill.
Phone RAndolph 6-4970

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Borer, Prybil 1 to 12 in. Hor. radial, $225
Blower, Sturtevant 30 in., BB, $75
Jointer, Buss 16 in. rd. head, $185
Jointer, Smith 12 in. heavy duty, $250
Molder, F&E No. 776, BB., electric 6 in., $3000
Molder, American 8 in. 4 side, lots of extras, $650
Molder, Smith late rd. head, 6 in. 4 side, $500
Ripsaw, Greenlee self feed, $350
Ripsaw, F&E No. 110 self feed, $275
Sander, Yates hand block belt, BB and MD, $375
Sander, C. M. Co. two spindle vertical, $100
Saw, Sidney Variety, $100
Shaper, American dbl. spdle., heavy duty, BB, $200
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Tenoner, Fay with two copes, $250
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Borer, 4-ft. Bell No. 105 auto. horiz., 4 heads
Cut-Off Saw, Buss Dbl. cabinet, motorized
Cutter grinder, Mattison No. 231, 98% new.
Dovetailer, Dodds 10-spindle, motor-driven.

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Saw Dust and Shavings Mill Exhausters and Blowers—Hundreds in stock, sizes to suit any need. Also Air Compressors, Fans, Rotary Blowers. Money Savers—Send specifications.

All machines rebuilt and fully guaranteed.

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HYSTER STRADDLE TRUCK, 54"x54"
2—YATES 281 BAND RIP SAWS, 44" diameter wheels, with 15 HP motor drive
JENKINS No. 123 16 Spindle Vertical GANG DOOR STILE BORING MACHINE which bores all dowel holes in 11 door stiles per minute, boring alternately right and left stiles.
42" YATES T 5 Auto. Turn. LATHE, 100" of bds.
BELL Tilting Power Deer Clamp, 5 & 3 HP mtr.
AMERICAN Arm Sander with 5 HP Motor
FARLEY & LOETSCHER MFG. CO.
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Air Compressors, various sizes
Air Compressor, Gardner Denver 10x10 Twin dmd.
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Band Saw, New Moak 36" bb. dmd.
Blowers, Sturtevant No. 70 & 55"
Borer, W&M No. 283B Single Spindle Vertical, dmd.
Boring & Sawing, McKnight 26F dmd.
Clamp, Lancaster
Clamp, Taylor, 40 sec. 4 clamps, 7 ft.
Clippers, Sheridan 65" dmd.
Clippers, Coe 88" bd. & motor
Dovetailers, Dodds, 15 spindle
Frequency changers, 30 KW dmd.
Glue jointer, Jenkins No. 343A bb. dmd.
Jointers, Crescent 12" rd. hd. bb. dmd.
Jointer, New Moak 12", bb. dmd.
Lathe, Yates No. 74 bb. dmd.
Mortiser, Sidney, single spindle pb. bd.
Mortiser, Greenlee No. 228 Vert. bd. & motor
Mortiser, W&M No. 288—5 spdle. Horiz. dmd.
Mortiser, W&M No. 284 Single Vertical, bb. dmd.
Moulder, Amer. No. 35—10" bb. dmd.
Moulders, Mattison No. 222, 6" bb. dmd.
Moulders, Vonnegut 12" bb. dmd.
Moulders, Yates-Amer. C-55—9" bb. dmd.
Moulders, Yates-Amer. C-89—6" bb. dmd.
Moulders, F&E 10" pb. bd.
Planers, Berlin 36", rd. hd., dmd.
Planers, New Crescent 24" bb. dmd.
Planer, Whitney 30" Single rd. hd. bb. dmd.
Planer, F&E No. 156 36 x 7 DMD rd. head
Planer-Matcher, Yates A1-15" x 6" rd. hds. pb. bd.
Redrier, Merritt 12 plate 36 x 72
Resaw, Connell & Dengler Circular pd. bd.
Router, Defiance, 2 spindle bb. dmd.
Routers, Carter, floor type, Heavy duty, electric
Sander, New Jefferson, hand block, bb. dmd.
Sanders, Mattison No. 134, pb. bd.
Sanders, Niagara Brush, bb. dmd.
Sander, Smith 49" 3-drum endless bed. bd.
Sander, 48" double disc, dmd.
Sander, W&M No. 171 Hand Block, pb. bd. & Motor
Sanders, F&E 60" 3 drum roll feed, dmd.
Sanders, McKnight sgl. drum 24" x 16" dmd
Sander, Oakley Model G2, bb. dmd. hd. block
Sander, Oakley H2, edge belt, bb. dmd.
Sander, Porter Cable vert. osc. dmd. Sgl. Spdle
Sander, Yates No. 431, 43" endless bed. dmd
Saw, Beach double cutoff
Saw, Beach swing cutoff, bb. dmd.
Saw, H&B No. 161 gang bb. & motor
Saws, Amer. No. 15, bb. dmd.
Saws, Hermance Gang Rip, pb. & motor
Saws, Jenkins 105A dbl. cutoff bb. dmd
Saws, Mattison No. 207, bb. dmd.
Saws, New Delta-Crescent 12" tilt. arbor, dmd
Saws, New Multiplex, 40A & 50A
Saws, Buss Tilt table Variety bb. dmd
Saws, Yates-Amer. No. 67 bb. dmd.
Shaper, Defiance dbl. spdle., bb. dmd.
Shaper, Whitney No. 389, dbl. bb. dmd
Shapers, New Moak single spindle, bb. dmd
Shapers, Greenlee No. 180 dbl. bb. dmd
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Tenoner, Hayes 6 ft. dbl. with copes, pb. bd. & motor
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Low pressure, 15 lbs. steam pressure, 30 lbs. water, 15,000 sq. ft. with 75 ft. of 30" stack and a Sterling vacuum heating pump, size No. 215SR1, 15,000 sq. ft., 20 lbs. pressure, 3 H.P., 220 V., 60 Cy., 3 Phase. Good working condition. $1,200 f.o.b., Morristown, Tennessee.

THE BERKLINE CORP.
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American 61" Sander, M.D.
Smith 43" Sander, B.B., M.D.
Mattison No. 124—6' Stroke Sander
Francis 42" Spreader, M.D.

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Kiln Dried—Solid Dimension Lumber
Northern Hardwoods, Rough, surfaced and moulded.
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36" Porter Facer with Jackson & Church feed. DMD, BB, with grinding stand
6" Moulder, H. B. Smith Ball Bearing V-Belt Drive

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New Delta 20A-30A-40A-50A Ball Bearing Radial Saws
20" Ball Bearing Band Saw
New Millbury Bench Tenoner. M.D.
New Pedestal Type Duro Router

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Flush Door Superintendent

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36" Dbl. Surfacer - Late Model.
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Open Back Morgan Nailer, DMD, Minimum opening 46"
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Bottom Carton Stapler for deep cartons
Right angle air screwdrivers or drills

GENERAL WOOD WORKS
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SITUATION WANTED

FACTORY SUPERINTENDENT—25 years' experience case goods and tables. Familiar with manufacturing methods including cost—time study, etc. Proven ability to handle men.

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c/o WOODWORKING DIGEST
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LUMBER SALES MANAGER

An excellent opportunity with one of the oldest and largest lumber firms in the country. Must be 38 to 48 years of age with a minimum of 15 years of experience in managing lumber sales of hardwood and softwood lumber. A substantial salary commensurate with ability will be paid for a qualified aggressive executive familiar with lumber markets.

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Carborundum Co.—page 77, Catalog No. 70

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B. M. Root Co.—page 22, Bulletin

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Greenlee No. 227 BM, Holl. Chisel, B.B., D.M.D.
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New Britain No. 2 Chain, M.D.

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Yates No. 156-30" Single, Cabt., B.B. D.M.D.
Whitney 36" Single, Cabt. Style, B.B., D.M.D.
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Peerless 14" Vert Belt, M.D.
Fay & Egan 16" Hor. Belt, M.D.
W & M No. 274 Edge Belt & Scroll, M.D.
Mattison No. 172 Osc. Edge Belt, M.D.

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Yates No. 430-8" Hand Block, M.D.
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Mattison No. 244, B.B., D.M.D.
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MARCH, 1953

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Please send information on PRODUCTS and SUPPLIES described on the following pages:

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- Bits, router
- Bleaches
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- Car Pullers
- Chisels
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- Clamps
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- Cutters
- Dimension Stock
- Dowels
- Drill Attachments
- Drill Presses
- Drills
- Dry Kilns
- Dryers
- Dust Collecting Equipment
- Electric Hoists
- Fasteners
- Files
- Filters
- Finishes
- Glue Equipment
- Gluers, electronic
- Grinders, knife
- Grooves
- Hand Frequency Heating Equipment
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- Jointers
- Knives, moulder
- Knives, planer
- Knives, shaper
- Knives, veneer
- Lathes
- Leader Hoists
- Lumber
- Machines, banding
- Machines, box & crate
- Machines, carving
- Machines, clamping
- Machines, door and sash
- Machines, dovetailing
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- Machines, filing & sharpening
- Machines, gluing
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- Machines, nailing
- Machines, saw setting
- Machines, screw driving
- Machines, stapling
- Matchers
- Moisture Meters
- Mortise chains
- Moulders
- Nails
- Packaging Material
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- Planers
- Planes
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- Presses, plywood
- Putty
- Reamers, hand
- Rippers
- Routers
- Safety Clothing
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- Sanders, belt
- Sanders, contour
- Sanders, disc
- Sanders, drum
- Sanders, endless belt
- Sanders, portable electric
- Sanders, special
- Sanders, variety
- Sandpaper
- Saws, arbor
- Saws, band
- Saws, chain
- Saws, cross-cut
- Saws, cut-off
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- Saws, portable electric
- Saws, radial
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Diehl No. 60 cont. chain-feed, b-b, d.m-d.
Fay & Egan No. 217 continuous chain-feed.
American 12-in. round head, motor-driven
Yates No. 199, 12" round head, motor driven

MORTISERS
Greenlee No. 228 vert., hollow-chisel, m-d.

MOULDERS
American No. 1, 4-in., 4-side, motor-driven
American No. 1, 6-in., 4 side, motor-driven
Eaglesfield 4-in., 4-side all-electric, b-b.
Mattison No. 262, 6-in., 4-side, all-elec., b-b.

PLANERS
Parks 12-in., single, ball-bearing, motor-dr.
Superior 24-in. single, motor-driven
Whitney No. 32, 30-in. sgl. cabt., d. m-d, b-b
Buss, No. 88, 30" Double Cabinet, Direct Motor Driven, Ballbearing
American No. 666, 30" dbl. cbt., d. m-d, b-b
Yates No. 177, 30" Fast Feed Double Roughing

ROUTERS
Porter No. 502, 2-spdl., b-b, d. m-d.

SANDERS
American 42-in. 3-drum, roll-feed, motor-dr.
Smith 43-in., 3-drum endless-bed, dir. m-d.
Amer. No. 2, 24-in. disc and oscillating spdl.
Mattison No. 138 hand block belt, motor-dr.
Delta 6-in. adjustable belt, ball-brg., m-d.
Nash No. 10, 48-in. 6-spdl. auto. turning, m-d.
Pearson edge moulding, ballbrg., dir. m-d.
Curtis No. 64 Auto-stroke, motor driven.

SAWS—CUT-OFF
Buss Double End, Motor Driven.
Bell No. 12-B dbl. mitre & cut-off, b-b, m-d.
Diehl No. 724-A, Straight Line, Floor Type, Automatic Hydraulic Direct Motor Driven, Ballbrg.
Racine floor type, motor-driven.
Porter C 43, Straight line floor type, direct motor driven, ballbearing

SAWS-RIP
Chicago Hand Feed, Ballbearing, Motor Driven
Diehl No. 75, Chain Feed, Direct Motor Driven, Ballbearing
Yates G-2 chain feed, motor-dr., ballbrg.
Mattison No. 207M chain feed, b-b, d.m.d.
Eaglesfield chain feed, dir. m-d, b-b.
Hermance Heavy Duty Gang, b-b, d. m-d.

SAWS—VARIETY
Greenlee No. 495 Tilting Arbor, d. m-d., ballbrg.
American No. 1, tilting-table, motor-driven
Dodds Tilting Table, Motor Driven.
Pettingell tilt arbor, roller table, m-d.

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Onsrud W125, 72-in. auto., multiple stations, ball-brg., dir. m-d, with freq. changer
Russ Double Spindle Hi-Speed, ballbrg., motor-dr.
Russ sgl.-spdl. hi-speed, dir. m-d, ball-brg.
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McKnight No. 71C chair back tenoner, m-d
Towsley single-end, tenon heads, cope, cut-off saw, motor-driven.

VENEER MACHINERY
Dennis veneer taping machine, motor-driven
Capital 54" Veneer Clipper, Motor Driven
Black 36"x72" Electric Press, direct motor drive.
Merritt 84x54 in. 3-pl. veneer redrier, d. m-d.

MISCELLANEOUS
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Sturdivant 55" Shavings Exhaust Fan
Invincible 40 in. shavings exhaust fan
McKnight No. 88 Saw & Chuck Machine, mtr. dr.
Mattison No. 231 univ. cutterhd. grdr., d. m-d.
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40 Section Taylor Power Operated Clamp Carrier
New Air Operated Frame and Chair Clamps

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Dodds 12-Spindle Dovetailer
Wysong & Miles No. 290 Auto. Dovetailing Mach.

GLUE SPREADERS

Black Bros. C-3 Resin 40 Gal. Mixer
44" New Black Bros. No. 22-D Double Rubber Roll Resin Glue Spreader
62" Black Dble. Rubber Roll Resin Glue Sprdr.
54" Union Dble. Rubber Roll Resin Glue Spreader

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36" American No. 9 Knife Grinder
Capitol 125" Knife Grinder
Practically New Stetson-Ross No. 372 Grinder and Jointer

JOINTERS

Diehl No. 660 Glue Jointer, Direct Motor Drive
Yates-American No. 213 Direct Motor Driven Glue Jointer

LATHES

Mattison 42" No. 57-D motor drive ball bearing
Mattison 30" No. 55-C motor drive ball bearing
Yates-American 30" T-5 Lathe

MATCHERS

Stetson-Ross Motor Driven End Matchers - Practically New
Yates-American A-20 Electric Planer & Matcher with double profile

MORTISERS

Wysong & Miles No. 288 direct motor driven 6-spindle mortiser
Wysong & Miles No. 286 Hinge Seat Mortiser
Wysong & Miles 6-Spindle No. 208 Mortiser
New Northfield Single Chain Saw Mortiser

MOULDERS

Vonnegut 4" electric Moulder
Yates-American 4" Type C-88 Electric Moulder
Woods 6" No. 134M Electric Moulder
Newman 6" No. 46 Electric Moulder
Yates-American 12" C-89 Electric Moulder
Newman 12" No. 27 Ball Bearing Belt Driven
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Yates 4" C-3A Belt Drive Moulder with motor
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Porter 30" Facer, Motor Driven, Ball Bearing
Whitney 36" Single Planer

DOUBLE PLANERS

Buss 36" Double Planer
Yates-American 30" No. 177 ball bearing, direct motor driven with electric grinder
Whitney 30" and 36" No. 24 direct motor driven, ball bearing, with grinder and jointer

SANDERS

Yates 43" No. 421 Endless Bed Sander
Mattison No. 124 Automatic Stroke Sander
Wysong & Miles 6" No. 294 Automatic Stroke Sander, Direct Motor Driven, Ball Bearing
Pearson Waterfall Sander
Oakley Semi-Automatic Stroke Sander
Oakley Model H drawer Sander
Nash No. 50 and No. 25 Turning Sander
McKnight Chair Back Post Hard Drum Sander

BAND SAWS

36" Yates-American Motor Driven Ball Bearing Band Saw

CUT-OFF SAWS

Mereen-Johnson No. 300 Double Cut-Off Saw
Wilkin-Challoner Chain Feed Double Cut-Off Saw and Panel Sizer
Yates-American No. 51 Direct Motor Driven Swing Saw
Beach Direct Motor Driven Ball Bear. Double Cut-Off Saws & Rip Saws for Sizing lge. Panels

RIP SAWS

New Marion Glue Joint Rip Saw, in stock here
Mattison No. 207 Direct Motor Driven Ball Bearing Glue Joint Rip Saw
American No. 15 Ball Bearing Chain Feed Rip Saw
Yates-American G-67 Chain Feed Rip Saw

ROUTERS

Yates-American U-9 Electric Router

SHAPERS

Whitney No. 251 Double Spindle Electric Shaper
Whitney No. 234 Double Spindle Electric Shaper
Onsrud W-125 Double Spindle Automatic Shaper
Onsrud W125 Single Spindle Automatic Shaper

TENONERS

Jenkins No. 95 Electric, Double-End

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Francis 76" Hydraulic Veneer Clipper
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MISCELLANEOUS

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Dodds 10, 15, 20 spindle

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Hawker No. 2 All Ball bearing & roller bearing VBD

JOINTERS

American 12" Wedge Bed BB
American 16" Wedge Bed BB
12" Colloday, L. Powers, H. B. Smith, Crescent, Sidney
Moak 16", Motor drive, BB
Northfield 12", Motor drive, BB
24" Porter DMD with knife grinder

LATHES

Mattison 55C BB Live Tailstock
Mattison 57D Ball Bearing

MORTISERS

Greenlee No. 228, Belt drive
New Britain No. 2 and 7
Northfield chisel mortiser, motor driven
Wallace chisel mortiser, motor driven

MOULDERS

Mattison No. 224 9" all electric, hopper fd.
Eaglesfield 6" DMD BB All Electric
Yates C4A 8 x 4 B.D.
Yates C55 9" DMD All Electric
Yates American, 18" DMD C55, BB
S.A. Woods No. 131 9", belt driven

PLANERS

Buss 30" No. 88 Double surfacer, DMD, DMF, BB
Buss No. 4 BB 30" single Sec. Feed & Chip CMD Knife Grinder
Northfield 24" single, MD motor fd. No. 5
Whitney No. 32 36" BB CMD Knife Grinder
Whitney No. 29 40" CMD, BB

PLANER & MATCHER

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ROUTERS

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Onsrud No. 255E, Single Phase

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Peerless 9", 14" and 20" horizontal
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Vonnegut vertical drum sander
Wysong & Miles edge sanders, osc. DMD
Wysong & Miles, Oakley, Mattison belt
Yates-American No. 431, 49", 3 drum

SAWS - CUT OFF

Porter C43 5 HP DMD BB
Heston & Anderson No. 5, No. 25 & No. 55
Multiplex 5 HP DMD BB
Wallace 2 HP DMD BB
DeWalt 1 to 5 HP DMD BB

SAWS - BANDSAWS

36" Towsley DMD
36" American, Tannewitz, Crescent, Oliver
27" Crescent Band Saw
32" Crescent guarded BB VBD
Northfield BB & DMD 20" to 36"
DoAll 36"

SAWS - RIP SAWS

Diehl No. 75 15 HP Motor DMD
Diehl BB No. 77 DMD HP
Hermance Straight Line Plain Bear., BD

SAWS - VARIETY

American No. 10 tilt top belt drive
BM Root tilt top belt drive
Northfield Tilt Top DMD
Fay & Egan DMD Tilt Arbor 5 HP
American Sawmill Tilt Arbor DMD 5 HP
50 other makes to choose from

SHAPERS

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American (s-30) Single spindle, 5 HP & 3 HP
Defiance 2 spindle, BB, Belt drive
McCartney BB 1 spindle
Smith Single spindle, BB, Belt drive
Yates N1 Single spindle (large top) BB

TENONERS

Fay & Egan single 5 heads CMD
Newman single end BD

MISCELLANEOUS

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Wardwell Y-18 Cir. Saw filer, M.D.

JOINTERS
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American No. 1, 24" BB, M.D.
Yates No. 199, 20" rd. hd. V-belt M.D.
Porter No. 300 16" BB., M.D.

LATHES
Oliver 12"x5' Bed, Hand Carriage
Imperial automatic shaping lathe, BB., M.D.
Porter 16"x10' bed with motor

MORTISERS
Whitney No. 67 Oscillating Bit., M.D.
New Britain No. 2 Chain, with motor

MOULDERS
Woods 10" five-head, all electric
Mattisen No. 226—12"x6", all electric
Yates No. 108, 10" belt dr. coupled motor
Woods No. 132-M 6" Electric
Y-A No. C-99 12" BB., D.M.D.
Yates No. C-3 4' fast-feed, with motor
Vonnegut 6" BB., D.M.D.

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PLANERS
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Newman No. 600 24" Sgl. D.M.D.
Yates B-2 36" double, M.D.
Yates No. 136 20" rd. hd. M.D.
Buss 6A 36" 6-roll single—D.M.D.
Yates No. 177, 30"x12" double, M.D.
American No. 80 15" double, heavy duty

ROUTERS
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Ekstrom-Carlson No. 126, BB., M.D.

SHAPERS
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Onsrud W-125 Automatic, 72" table
Whitney No. 165 S.S. motor on arbor
Onsrud No. 248 single spdl., high speed
Whitney No. 282 sgl. D.M.D. 56"x40" table

SANDERS
Yates-Amer. S33-61" 3 Dr. End Bed Sander M.D.
Yates-American S42—30" 2 dr. End. Bed., M.D.
Yates No. 421 49" 6-drum with motors
Solem No. 370, 2-drum 43" End. Bed.
Fay & Egan 30" 3-drum roll feed
Mattison No. 124, 6' auto. stroke, M.D.
Yates-American No. 7 disc and spindle
Yates No. 431, 43" 3-drum end. bed, M.D.

MITRE SAWS
Greenlee No. 495 Tilting Arbor, D.M.D.
Tannewitz J-250 Tilting Arbor, D.M.D.
American Dbl. revolving arbor, 5 HP belted mtr.
Whitney No. 77 tilting arbor, D.M.D.

CUT-OFF SAWS
Oliver No. 94-D Straight Line, Mtr. on arbor
American No. 51 swing saw, M.D.
Greenlee No. 451 auto. cut-off and dado
Buss double cabinet type, M.D.
Porter 43-20S 36" stroke, motor on arbor

RIP SAWS
Yates G-77, Chain Feed BB., M.D.
Beach No. 209, power feed, BB., M.D.
Sinker-Davis No. 13 power gang, 25 HP mtr.
Greenlee No. 426 Roll Feed with motor

TENONERS
W-C No. 70 jump dado, BB., D.M.D.
Greenlee No. 530 Single, BB, with motor
American single end, with copes, rolling table
Jenkins No. 95 double end, jump dado., D.M.D.

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Peerless Horiz. 14" Motor
Yates-American No. 433—49" 3-drum BB, MD

CUT-OFF SAWS
Porter 43 SL Air Operated

SHAPERS
Buss Double Spindle MD
Whitney No. 395 Double Automatic

TENONERS
Wilkin Challoner 96x72 D. E. Tenoner

MISCELLANEOUS
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McKnight No. 1-E Saddle Seat Machine
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G.E. 10 KW 60/120 cycles
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Bell 72" Plate Edge Gluer
Black 5-Gal. Portable Resin Mixer
Black 30-Gal. Cold Resin Mixer
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Jenkins No. CD Cont. Feed Glue Jointer 30" with Billstrom Feed Attach.
LATHES
Imperial Auto. Turning, D.M.D.
Mattison No. 55C Ball Brg. Auto. Turning
MORTISERS
Wysong & Miles No. 283 F.F. Hollow Chisel
Wysong & Miles No. 284 P.F. Hollow Chisel
Fay & Egan No. 462 P.F. Hollow Chisel
American No. 20 P.F. Hollow Chisel
MOULDERS
Hermance No. 50 - 10" Ball Bearing
Mattison No. 226, 12" All-Electric
Smithway "XL" 4" Ball Brg., M.D.
Hermance 6" 4-Side, Motor Driven
PLANERS
Buss 30" & 36" Single, M.D.
Whitney 30" Dbl., 8 feed rolls
SANDERS
Fay & Egan 48" 3-Drum Endless Bed
Mattison No. 137 Hand Block Belt Sander
Pearson Model A Moulding Sander
Curtis No. 11 Semi-Auto. Belt Sander
Loeffler 16x24" B.B. Sanding Drum
SAWS - CUT-OFF
Porter Floor Type, with Table
Y-A No. C44 Floor Type, with Table
Bell No. 12 - Root & Beach Dbl. Cut-Off
SAWS - CHAIN FEED
Diehl No. 55 M.D. Chain Feed Rip
Yates G-2 B.B. Chain Feed Rip
SAW TABLES
Tannewitz SJ Tilting Arbor
American Dbl. Revol. Arbor
SHAPERS
Porter No. 200 SVM Single, M.D.
Whitney No. 165 D.M.D., Single
Porter No. 155 Serpentine Shaper
TENONERS
Colladay-Power-Fay Egan, Single End
VENEER MACHINERY
Capital 150" Veneer Clipper
Jenkins No. 23 DMD, Ball Brg. Jointer
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Union 36" and 60" Dbl. Roll Resin Glue Spreaders.
Francis 12-in. and 18-in. edge glue spreaders.

JOINTERS
* Porter No. 300CM, 12-in. hand jointer.
* American No. 1, 16-in. hand jointer.
* Yates-American No. 213 glue jointer.
* Jenkins No. 343-A glue jointer.
* Diehl No. 60 glue jointer.

LATHES
* Mattison No. 55C and F Auto. Turning Lathes, b.b.
* Yates-American T-5 auto. turning lathe.

MORTISERS
* Greenlee No. 227 automatic hollow chisel mortiser.
New Britain Nos. 2 and 7 chain saw mortiser.
* Whitney No. 67 horiz. osc. bit mortiser.

MOULDERS
* Woods No. 808M, 4-in. electric moulder.
* Woods No. 144M, 2-head electric moulder.
* Yates-American C-88 6" electric moulder
* Mattison No. 276—6-in. electric moulder.
* Vonnegut 6-in. electric moulder.
* American No. 37, 7-in. electric moulder.
* Yates No. 108—10 in. heavy-duty moulder.
Yates C3A-4" belt drive moulder.

PLANERS—Facing
* Porter 24-in. facing planer—Herzog feed.

PLANERS and MATCHERS
* Yates-American A23 flooring machine.
* Stetson-Ross 36A end matchers.

PLANERS
* Buss 4-A 30-in. single planer.
* Whitney No. 29—36-in. single planer.
* Whitney No. 24—30-in. and 36-in. double planer.
* Whitney No. 33 32-in. heavy duty double planer.
* Greenlee No. 120 30" double planer

ROUTERS
* Onsrud W-240 heavy duty electric router.
* Porter No. 600 and 610 heavy duty elec. routers.

DRUM SANDERS
* Smith No. 404B—42" & 49" 3-drum endless bed sanders
Yates No. 431—31, 43-in. 3-Dr. end. bed mtrzd.
* Solem S 3-M 73-in. 3-drum endless bed sander.
American No. 9—61-in. 3-drum roll feed, mtrzd.

SANDERS—Belt & Miscellaneous
* Wysong & Miles No. 294 auto. stroke sander.
Mattison No. 124 auto. stroke sander.
* Wysong & Miles No. 277 hand block belt sander.
Nash No. 25 and No. 40 auto. spindle sanders.
* Pearson Model A moulding sander.

SAWS—Band Scroll & Resaws
* Tannewitz Type G, 36-in. band scroll saw.
* Fay & Egan No. 50—36-in. band saw.
* McDonough 44-in. vertical band resaw.

SAWS—Cut-Off
* NEW Beach No. 599 auto. cut-off saw.
* Porter 43-20S straight-line cut-off saw
* Yates-American G-44 straight line cut-off saw.
* Jenkins No. 105-A dbl. cut-off and mitre.
* Bell 12B double cut-off and miter saw.

SAWS—Rip
* Diehl No. 75 straight line ripsaw.
* Mattison 202 & 207 straight line ripsaws.
* Yates-American G-77 straight line ripsaw.
* Yates-American G-50 heavy duty ripsaw.
Greenlee No. 426 self feed ripsaw.
American No. 1 self-feed ripsaw.

SASH & DOOR MACHINES
* Bell No. 11 power door clamp.
Millbury Pocket Cutter.

VARIETY SAWS
* Eaglesfield tilting arbor variety saw.
* Fay & Egan No. 500 tilt-table variety saw.
* Baker double arbor variety saw, b.b.

SHAPERS
* NEW Crescent No. S-2 single spindle shaper.
* Moak No. 7 single spindle shaper, b-m-d.
* Onsrud No. 248 single spindle shaper BMD.
* Porter No. 103 single spindle shaper.
* Porter No. 201 double spindle shaper.
* Whitney No. 8 double spindle shaper, b-m-d.
* Whitney No. 351 double spindle, 12½ HP motors
* Whitney No. 295 automatic, double spindle shaper.
* Onsrud No. 125B automatic single spindle shaper.
* Onsrud WB-85 auto. dbl. spdle. shaper

TENONERS
* Greenlee No. 530 and 534 single end tenoners, b.b.
* Wilkin-Challoner No. 70 - 96-in. dble. end tenoner
* Jenkins No. 95—96-in. double end tenoner.
Jenkins No. 96 60-in. double end tenoner, b.b.

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Francis 36"x84" hyd. veneer presses.
Merritt 84x54—8—10—12 plate redriers.
Jackson 66"x42" veneer lathe

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Food Machinery Co. Model AC-2 boxmaker.
* Woods No. 227 side head grinder.
NEW Hanchett No. 133 auto. band resaw sharpener.

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Jointer: Famous 16" B.B. Motor Drive
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Planers: New Powermatic 12 x 4—16 x 6, Delta 13 x 5
Mortiser: hollow chisel H&B with motor
Planers, Dble.: Whitney 30 x 7" with mtrs.
Planer, Dble.: Yates No. 186—30 x 6" M/D. long bed
Rip Saw: Diehl No. 55—10 HP motor
Resaw, Band: Mershon 54" New Standard with motor
Moulder: Yates-American No. C3A-4" B.B. M.D.
Moulder: Yates No. C3—4"—4 side
Rip Saw: XL Ripper with 10 HP motor
Router: Onsrud No. W-240—7½ HP motor
Radial Saws: New Delta Multiplex No. 40C and No. 50C
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Sander, Belt: Fay & Egan No. 553 with motor
Tenoners: single end American No. 2½ and No. 1 with copes
Tenoner: Dbl. End Wilkins-Challoner 120" with copes
Tilting Arbor Saws: Delta 12", Delta Unisaw 10"
Shapers: Single Spindle Fay & Egan No. 242 and No. 552
Shaper: Dble. Spindle, Buss BB with 25 HP motors
Shaper: Dbl. Spindle, Whitney with frequency changer
Nailing Machine: Doig No. 4—8 Track Closed Back M.D.

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Hermance No. 77 Ball Bearing Electric Single End Tenoner
Hermance Belt Drive Single End Tenoner
American No. 1 Single End Tenoner
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Ekstrom Carlson No. 464—6" Ball Bearing Moulder
Yates-American No. C-55—12" Ball Bearing Electric Moulder
Hermance No. 50—8" Ball Bear. Moulder
Vonnegut 6" Ball Bearing Electric Moulder
Matttison No. 207 Ball Bearing Direct Motor Driven Rip Saw
Greenlee No. 356 Single Spindle Boring Machine
Wysong & Miles No. 255 Hollow Chisel Mortiser, with motor
Solem 53-M—49" BB Three Drum Endless Bed Sander
Porter Straight Line Cut-Off Saw
Buss Double Cut-Off Saw
Tannewitz 42" Ball Bearing Band Saw
Buss 36" Ball Bearing Double Planer
Whitney No. 24—30" BB Double Head Cabinet Planer
Whitney No. 39-A DMD BB Double Spindle Shaper
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Yates-American No. 1 Motor Driven Ball Bearing Variety Saw
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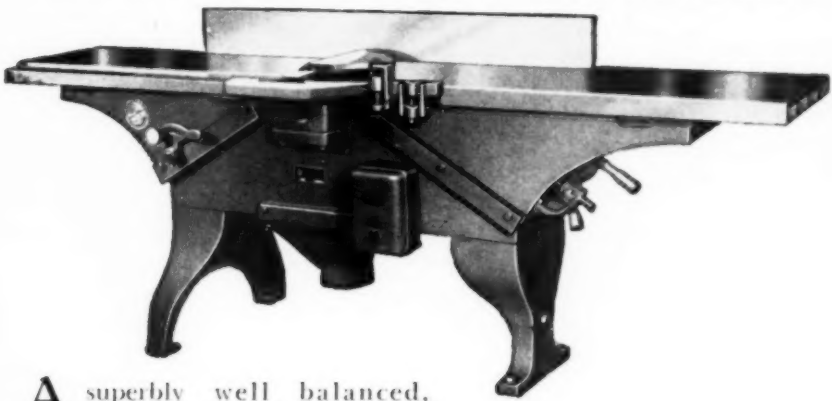

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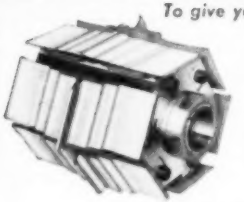

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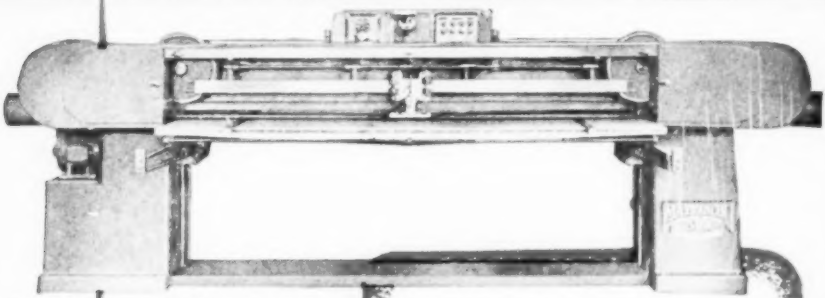
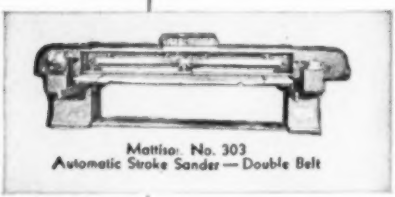


Front View Mattison No. 303
Automatic Stroke Sander — Single Belt



Mattison No. 303
Automatic Stroke Sander — Double Belt

Rear View Mattison No. 303
Automatic Stroke Sander Single Belt

• The Mattison No. 303 Automatic Stroke Sander is the last word in modern engineering. From the standpoint of design — construction — smoothness of operation and appearance, it is in a class by itself. Results that can be expected are faster output, better quality of work, and trouble free operation. These important features are all to your advantage. Hydraulic system for operation of shoe is simple yet positive in action, providing smooth operation of sanding shoe the entire length of stroke. Belt speeds to meet your needs. All controls are within easy reach of operator. The sand belt is completely enclosed at top and both ends for dust control and safety. Belts are easily and quickly changed. Aluminum sanding shoe is mounted on ball bearings for easy operation and control. Massive base and column construction provide solid foundation. The Mattison No .303 Automatic Stroke Sander is recommended as the most efficient method for finish sanding large, flat surfaces such as tops, panels, doors, etc. It provides perfect work on a real production basis. Double-belt model with coarse belt for removing tape and glue, and fine belt for finish sanding, speeds up production by reducing handling time and, in many cases, eliminates drum sander operation.

Send for complete information on the 303, the latest in stroke sanders.

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